FIBOCOM
Perfect Wireless Connection

G600&G610 GPRS Module
AT Command User Manual (ADD)

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1 Hardware Related Functionalities

1.1 +WRIM, RI Pulse Width Control

RI pulse width control of SMS and incoming call.

Command	Syntax	Response/Action	Remarks
Set	+WRIM=<type>,<width>	OK or: ERROR	Set RI pulse width control of SMS and incoming call.
Read	+WRIM?	+WRIM: <type>,<width> OK or: ERROR	Query RI pulse width control of SMS and incoming call.
Test	+WRIM =?	+WRIM: <type>,<width> OK or ERROR	Query the types and range for pulse width.

Details of Parameter

<Parameter>	Description
< type >	0: indicate incoming call 1: indicate SMS
<width>	RI pulse width: 1~2000ms; 0: reset to default parameter (default for incoming call is 1000ms, for SMS is 150ms).

1.2 +MCHARGE, Charge Management

This command will indicate the charge feature.

Command	Syntax	Response/Action
Set	+MCHARGE=<mode>	OK or: +CME ERROR: <err>
Read	+ MCHARGE?	+ MCHARGE: <chr_state>,<chr_event>,<chr_alarm>, <chr_capacity> or: +CME ERROR: <err>
Test	+ MCHARGE=?	+ MCHARGE: (list of parameters) <chr_state>,<chr_event>,<chr_alarm>,<chr_capacity> OK

The following table shows the + MCHARGE parameters.

<Parameter>	Description
<mode>	<mode> integer indicating mode of sending unsolicited responses or not, may be: 0: disabled // not send URC 1: enabled // automatically send URC, and check the URC of <chr_state>,<chr_event>,<chr_alarm>,<chr_capacity> in real-time An unsolicited response <chr_state> will be sent initially to report the current charging state (The value of the< chr_event> parameter will be undefined for this case). Likewise an unsolicited response <chr_event> will be sent when the status of charging event is changed. Additionally an unsolicited response<chr_alarm> will be sent in case an alarm is active.
<chr_state>	<chr_state> integer value indicating the resulting charging state of the battery driver, may be: 0: CHARGER_NOT_CONNECTED // no connected 1: CHARGER_CONNECTED_NOT_CHARGING, //connected charge, but not start charging.

	2: CHARGER_CONNECTED_CHARGING // in charging processing.
<chr_event>	0:CHR_CHARGE_UNDEFINED_IND // NO defined charge event 1: CHARGE_END_IND // Battery is full (Note: please give the value of voltage when the battery is full.) 2: CHARGE_STOP_IND //battery is not full, but charge is stopped.
<chr_alarm>	<chr_alarm> integer value indicating the type of battery driver alarm issued, may be: 0: CHR_LOW_BATT_ALARM (low battery level reached) (Note: please give the voltage value of low battery level) 1: CHR_BATT_SHUTDOWN_ALARM (shutdown battery level reached) (Note: please give the voltage value of shutdown battery level) 2: CHR_LOW_BATT_CLEARED (cease battery alarm)
<chr_capacity>	<chr_capacity> integer value indicating the capacity of battery: 0: below 10% 1: 10~30% 2: 30~50% 3: 50~70% 4: 70~90% 5: above 90% Note: the value is depended on different voltage.

2 Related Functionalities of Internal Protocol Stack

2.1 New Added AT Command

2.1.1 +MIPKPAL, TCP Keepalive Functionality

This command indicates is used to turn on or off keepalive functionality for TCP connection.

Command	Syntax	Response/Action	Remarks
Set	+MIPKPAL=<SockID >,<Mode>,<Time>	OK or: ERROR	This command is used to turn on or off keepalive functionality for TCP connection. It can be used with 2 sets of G600 protocol stacks.
Read	+MIPKPAL?	+MIPKPAL:<SockID1>, < Mode >,<Time> +MIPKPAL:<SockID2>, < Mode >,<Time> +MIPKPAL:<SockID3>, < Mode >,<Time> +MIPKPAL:<SockID4>, < Mode >,<Time> OK	Query all conditions of keepalive connection.
Test	+MIPKPAL =?	+MIPKPAL:(list of < SockID >),(list of < Mode>),(list of < Time >), OK	Query range list of stat

Details of Parameter

<Parameter>	Description
< SockID >	Connective ID: 1-4
< Mode >	Keepalive connection setting: 0: turn off (default) 1: turn on
< Time >	Sending period of keepalive: 1000-600000 (unit: ms)

2.2 MMS Command

2.2.1 +MMSSERVER, Setting the APN, MMS Server, Gateway and Port Number.

This command is used to set and read the current sending address of MMS server, gateway and port number.

Command	Syntax	Response/Action	Remarks
Set	+MMSSERVER=<apn>,<server ip address>, <gateway>,<port>	OK or: ERROR	Set the MMS sending server IP address, gateway and port number. Not-saved without power. The server IP address, gateway and port number are defined by operators. The wrong address will cause the failure of MMS sending.
Read	+ MMSSERVER?	+ MMSSERVER: < apn >,< server ip address >,< gateway >,< port > OK or: ERROR	Return the preset server IP address, gateway and port number. Return OK if no content.
Test	+ MMSSERVER =?	+ MMSSERVER: (<"apn name">), (<"server ip address">), (<"gateway address">), (<port number>) OK	Test the format and range of server IP address, gateway and port number.

Below shows +MMSSERVER Command parameter:

<Parameter>	Description
< apn >	Network APN
< server ip address >	Server IP address.
< gateway >	Gateway
< port >	Port number

Example:

AT+MMSSERVER="cmwap","http://mmsc.monternet.com/" ,"10.0.0.172",9201

OK

AT+MMSSERVER?

+ MMSSERVER: "cmwap","http://mmsc.monternet.com/" ,"10.0.0.172",9201

OK

AT+MMSSERVER=?

+ MMSSERVER: "apn","MMS server ip address" ,"gateway address",(1-65535)

OK

2.2.2 +MMSSUB, Import the MMS Title into Module by Series

This command is used to import the MMS title into module by series for sending MMS. There are two interactions between user and module via series. First one is for sending coding format and size. The other is for title.

Command	Syntax	Response/Action	Remarks
Set	+MMSSUB=<ENCODE>,<LENGTH>	OK or: ERROR	Module receives the command of AT+MMSSUB=<ENCODE>,<LENGTH> and return OK via series. It will not accept other AT command until receiving data from series. The data from series will be treated as title content. When the received data equals to preset size, it will quit receiving mode and return OK to series. If it cannot receive any data within a minute, it will quit receiving mode directly and return ERROR to series.
Read	+MMSSUB?	+ MMSSUB: <ENCODE>,<LENGTH> OK	Read the coding format and size of current module. It returns OK if no content.
Test	+MMSSUB =?	+ MMSSUB: (list of supported < ENCODE >s),(list of supported < LENGTH >s) OK	Test the setting format of this command, range of coding format and range of length.

Below shows + MMSSUB command parameter:

<Parameter>	Description
< ENCODE >	Data coding format: 0: ASCII coding 1: GB2312 coding
< LENGTH >	Data length which less than 64 bytes

Example:

```
AT+MMSSUB= 0, 50          //  0 indicates ASCII coding format
OK                        //  Module returns OK and wait for the user to input data.
DATA                      //  User inputs data.

OK                        //  Receive data and return OK.

AT+ MMSSUB =?
+ MMSSUB：(0,1),(1-64)
OK

AT+MMSSUB?
+ MMSSUB：0，50
OK
```

2.2.3 +MMSTXT, Input the MMS Text Data to Module via Series

This command is used to input the MMS text data to module via series for sending MMS. There are two interactions between user and module via series. First one is for sending coding format and size. The other is for text data.

Command	Syntax	Response/Action	Remarks
Set	+MMSTXT=<ENCODE>,<LENGTH>	OK or: ERROR:	Module receives the command of AT+ MMSTXT =<ENCODE>,<LENGTH> and return OK via series. It will not accept other AT command until receiving data from series. The data from series will be treated as text data. When the received

			data equals to preset size, it will quit receiving mode and return OK to series. If it cannot receive any data within a minute, it will quit receiving mode directly and return ERROR to series.
Read	AT+MMSTXT?	+ MMSTXT: <ENCODE>,<LENGTH> OK	Read the coding format and size of current module. It returns OK if no content.
Test	AT+MMSTXT =?	+ MMSTXT: (list of supported < ENCODE >s),(list of supported < LENGTH >s)	Test the setting format of this command, range of coding format and range of length.

Below shows + MMSTXT command parameter:

<Parameter>	Description
<ENCODE>	Data coding format: 0: ASCII coding 1: GB2312 coding
<LENGTH>	Data length which less than 8 bytes

Example:

AT+ MMSTXT = 0, 1024 // 0 indicates ASCII coding format

OK // Module returns OK and wait for the user to input data.

DATA // User inputs data.

OK // Receive data and return OK.

AT+ MMSTXT =?

+ MMSTXT：(0,1),(1-8096)

OK

AT+MMSTXT?

+ MMSTXT：0，1024

OK

2.2.4 + MMSIMG, Input the MMS Image Data to Module via Series

This command is used to input the MMS image data to module via series for sending MMS. There are two interactions between user and module via series. First one is for sending image format and size. The other is for image data.

Command	Syntax	Response/Action	Remarks
Set	AT+MMSIMG=<TYPE>,<LENGTH>	OK or: ERROR	Module receives the command of AT+ MMSIMG =< TYPE >,<LENGTH> and return OK via series. It will not accept other AT command until receiving data from series. The data from series will be treated as image data. When the received data equals to preset size, it will quit receiving mode and return OK to series. If it cannot receive any data within a minute, it will quit receiving mode directly and return ERROR to series.
Read	AT+ MMSIMG?	+ MMSIMG: <TYPE>,<LENGTH> OK or: OK	Read the image format and size of current module. It returns OK if no content.
Test	AT+ MMSIMG =?	+ MMSIMG = (list of supported < TYPE >s),(list of supported < LENGTH >s) OK	Test the setting format of this command, range of image format and range of length.

Below shows + MMSIMG command parameter:

<Parameter>	Description
<TYPE >	Image format: 0: JPG

	1: GIF
< LENGTH >	Data length which less than 300000 bytes

Example:

AT+ MMSIMG = 0, 8096 // 0 indicates .jpg format

OK // Module returns OK and wait for the user to input data.

DATA // User inputs data.

OK // Receive data and return OK.

AT+ MMSIMG =?

+ MMSIMG：（0，1），（1-300000）

OK

AT+ MMSIMG?

+ MMSIMG：0，8096

OK

2.2.5 + MMSAUD, Input the MMS Voice Data to Module via Series

This command is used to input the MMS voice data to module via series for sending MMS. There are two interactions between user and module via series. First one is for sending voice format and size. The other is for voice data.

Command	Syntax	Response/Action	Remarks
Set	AT+MMSAUD=<TYPE>,<LENGTH>	OK or: +CME ERROR: <err>	Module receives the command of AT+ MMSAUD =< TYPE >,<LENGTH> and return OK via series. It will not accept other AT command until receiving data from series. The data from series will be treated as voice data. When the received data equals to preset size, it will quit receiving mode and return OK to series. If it cannot receive any data within a minute, it will quit receiving mode

			directly and return ERROR to series.
Read	AT+ MMSAUD?	+ MMSAUD: <TYPE>,<LENGTH> OK or: OK	Read the voice format and size of current module. It returns OK if no content.
Test	AT+ MMSAUD =?	+ MMSAUD: (list of supported < TYPE >s),(list of supported < LENGTH >s) OK	Test the setting format of this command, range of voice format and range of length.

Below shows + MMSAUD command parameter:

<Parameter>	Description
< TYPE >	Voice format: 0: midi 1: amr 2: wav
< LENGTH >	Data length which less than 64 Kb

Example:

AT+ MMSAUD=0, 16345 // 0 indicates amr format

OK // Module returns OK and wait for the user to input data.

DATA // User inputs data.

OK // Receive data and return OK.

AT+ MMSAUD=?

+ MMSAUD: (0-2),(1-65535)

OK

AT+ MMSAUD?

+ MMSAUD：0,16345

OK

2.2.6 + MMSSEND, Send a MMS

This command is used to package the related data as a MMS and send to the specific object.

Command	Syntax	Response/Action	Remarks
Execute	AT+MMSSEND=<DA>,<SUB>,<TEXT>,<IMAGE>,<AUDIO>	OK OK or: OK +CME ERROR: <err> or: +CME ERROR: <err>	Module will judge the correction of parameter after receiving this command. If it is not correct, it returns ERROR and ends the operation. If it is correct, it returns OK and packages the related text, title, image and voice data as a MMS based on the option of parameter. This MMS creates a socket via GPRS and total size should be less than 300Kb. It will send the MMS data to specific server and returns OK for success but ERROR for failure. The operation of this command will stop if MMS is sent successfully. The series will not receive and deal with the other AT command until the pre-operation is done.
Test	AT+ MMSSEND?	ERROR	Not support
Test	AT+ MMSSEND =?	+ MMSSEND: (<" phone number or email address">),(list of supported< SUB >s), (list of supported< TEXT >s), (list of supported< IMAGE >s), (list of supported< AUDIO >s) OK	Test the command format, parameter value and range.

Below shows + MMSSEND command parameter:

<Parameter>	Description
<DA>	Receive phone number or email address
< SUB >	Subject switch: 0: MMS not including subject 1: MMS including subject
< TEXT >	Text switch: 0: MMS not including text 1: MMS including text
< IMAGE >	Image switch: 0: MMS not including image 1: MMS including image
< AUDIO >	Voice switch: 0: MMS not including voice 1: MMS including voice

Example:

AT+MMSSEND="13902965084",1,1,0,0 // the first parameter indicates target address,
OK // and the following is content switch. All should be less than 300Kb.
OK // Send successfully.

AT+MMSSEND=?
+MMSSEND:"phone number or email address",(0,1) ,(0,1) ,(0,1) ,(0,1)

OK

2.2.7 + MSTI, Unsolicited Response (new MMS alarmed by PUSH message)

It will send to terminal when module receives new MMS and is alarmed by PUSH message.

+ MSTI: <mem>,<index>,<classtype>

Below shows + MSTI command parameter:

<Parameter>	Description
<mem>	Message memory space. "SM" - ME memory storage.
<index>	Location of the new message.
< classtype >	

Example:

+MSTI:"SIM",11,"MMS PUSH"

2.2.8 +MMSRDPUSH, Read the Content of PUSH Message

This command is used to read the content of PUSH message.

Command	Syntax	Response/Action	Remarks
Set	AT+ MMSRDPUSH =<index>	+ MMSRDPUSH: <sender>,<transactionID>,<location>,<time>,<size> OK or: +CME ERROR: <err>	Module receives the command of AT+ MMSRDPUSH =< index> and shows the MMS content after resolving. The content shown includes the transferring ID, address of storage, sending number and MMS size.

Below shows + MMSRDPUSH command parameter:

<Parameter>	Description
< index >	The position of PUSH message in SIM card
< sender >	MMS sending address
< transaction ID >	MMS transferring ID
< location >	MMS storage position
< time >	MMS sending time
< size >	MMS data packet size

Example:

AT+ MMSRDPUSH =11 // Read PUSH message content

+MMSRDPUSH:

"13818181818","",ON0RPFNTWRBB"","HTTP://211.136.113.36/ON0RPFNTWRBB"","10/12/20,18:33:59+32",1920

OK

AT+ MMSRDPUSH =10

ERROR // Return ERROR if it is not PUSH message

AT+ MMSRDPUSH =?

ERROR

AT+ MMSRDPUSH?

ERROR

2.2.9 +MMSRECV, Download MMS from Server

This command is used to download MMS from server.

Command	Syntax	Response/Action	Remarks
Set	AT+ MMSRECV =<index>	+ MMSRECV: <sender>,<time>,<size>CR 1,<name>,<type>,<length>CR 2,<name>,<type>,<length> OK or: +CME ERROR: <err>	After module receives the command of AT+ MMSRECV =< index>, it will resolve the corresponding PUSH message by MMS index to get and display the storage address and size of MMS. Then it connects server to download MMS. If the downloading of MMS takes much time, it will show +MMS RATE: xx%. After downloading, it will resolve the MMS content and display the information.

Below shows + MMSRECV command parameter:

<Parameter>	Description
<index >	MMS index (corresponding position of PUSH message stored in SIM card)
< sender >	MMS Sending address
< time >	MMS sending time
< size >	MMS data packet size
< name >	Data name
< type>	Data type (refer to appendix 1)
< length >	Data length

Remark: It shows MMS downloading progress if it takes much time.

Format: +MMS RATE: xx%

Example:

AT+ MMSRECV =11 // Download MMS from server

+ MMSRECV: "13818181818","10/12/20,18:33:59+32",49200

+MMS RATE: 30%

+MMS RATE: 60%

+MMS RATE: 90%

1,"pic001.jpg",4,42177

2,"hello.txt",1,2000

3,"pres.smil",0,300

OK

AT+ MMSRECV =10 // Wrong Index

ERROR

AT+ MMSRECV =?

ERROR

AT+ MMSRECV?

ERROR

2.2.10 + MMSVIEW, Display the MMS Content Stored in Current Module

This command is used to display the MMS content stored in current module.

Command	Syntax	Response/Action	Remarks
Set	AT+ MMSVIEW	+MMSVIEW: <status>,[<sender>,<time>, <size>] CR [<index>,<name>,<type>,<length>CR <index+1>,<name>,<type>,<length>] OK or: OK	Module receives the command of AT+ MMSVIEW and shows the MMS information via series. It firstly displays the MMS condition (sent or received), sent or received number, sending time and MMS size. And followed by other file information including in MMS.

Below shows + MMSVIEW command parameter:

<Parameter>	Description
< status >	Current condition of MMS (received, sent)
< sender >	MMS sending address
< time >	MMS sending time
< size >	MMS data packet size
< name >	Data name
< type>	Data type (refer to appendix 1)
< length >	Data length
<index>	MMS including file index beginning from 1.

Example:

AT+ MMSVIEW // MMS content stored in current module.

+ MMSVIEW: "received","13818181818","2010-7-21",1920

1,"pic001.jpg",4,42177

2,"hello.txt",1,2000

3,"pres.smil",0,300

OK

AT+ MMSVIEW // MMS content stored in current module for sending.

+ MMSVIEW: "sent"

1,"234.jpg",4,42177

2,"t",1,2000

OK

AT+ MMSVIEW // No MMS content.

OK

2.2.11 + MMSREAD, Read Current Stored MMS Content

This command is used to send the specific MMS content to series for output.

Command	Syntax	Response/Action	Remarks
Set	AT+ MMSREAD=< index >	+MMSREAD:<name> , <type>, <size>CR DATA OK or: OK	Module receives the command of AT+ MMSREAD and reads the corresponding file within MMS. Via series, it lists the file name, file type and size firstly. And it outputs data by CR / LF, and displays OK after outputting data and ends the command.

Below shows + MMSREAD command parameter:

<Parameter>	Description
<index >	MMS including file index (corresponding <index> value of AT+MMSVIEW)
<name >	File name
< Type >	File type (refer to appendix 1)
< size >	File size

Example:

AT+ MMSREAD =1 //

+MMSREAD: "mms.sml",0,305 // Display file name, type and size in first line.

<smil> // Display text data directly.

<head>

<layout>

<region id="Text" />

<region id="Image" fit="meet" />

</layout>

</head>

<body>

<par>

<text src="hello.txt" region="Text" />

<audio src="aud169.mid" />

</par>

</body>

</smil>

OK

AT+ MMSREAD =2 //

+MMSREAD: "123.jpgl",4,21791

…… //Binary image data

OK

AT+ MMSREAD =9 //Display OK if there is no corresponding data

OK

2.2.12 Corresponding Value of MMS Data Type

128: unknown

0: smil

1: text

1: text/plain

2: text/wml

3: image/gif

4: image/jpg

5: image/bmp

6: image/wbmp

7: image/png

8: audio

9: audio/mid

10: audio/amr

11: audio/wave

2.3 Procedure of MMS Command

2.3.1 MMS Sending Command

Classified by AT command, MMS has totally 6 commands including MMS settings, data importing and MMS sending. Please refer to above section for command details.

2.3.2 Set MMS Accessing Point, Server and Gateway

AT+MMSSERVER=<apn>,<server ip address>,<gateway>,port

e.g.1 : AT+MMSSERVER="cmwap","http://mmsc.monternet.com/" ,"10.0.0.172",9201 (CMCC)

e.g.2 : AT+MMSSERVER="uniwap","http://mmsc.myuni.com.cn/" ,"10.0.0.172",9201 (Unicom)

Description:

This setting will not be saved without power. It will fail to send MMS if the parameter setting is wrong.

2.3.3 Edit MMS Subject (optional)

AT+MMSSUB=<ENCODE>,<LENGTH>

e.g.: AT+MMSSUB= 0, 50

OK

… //transferring data

OK

Description:

Coding types are 0 and 1 which indicates ASCII and GB2312-80 formats. Its length cannot be over 64 bytes or it will quit with error. Input this command and wait for the OK returned. Then import data via series tool and get OK returned again at the end of command processing. The content will not be saved without power. This step

can be skipped if not editing subject.

2.3.4 Edit MMS Text Content (optional)

AT+MMSTXT=<ENCODE>,<LENGTH>

e.g.: AT+MMSTXT= 0, 1000

OK

… //transferring data

OK

Description:

Coding types are 0 and 1 which indicates ASCII and GB2312-80 formats. Its length cannot be over 8092 bytes or it will quit with error. Input this command and wait for the OK returned. Then import data via series tool and get OK returned again at the end of command processing. The content will not be saved without power. This step can be skipped if not editing text content.

2.3.5 Edit MMS Image Content (optional)

AT+MMSIMG=<TYPE>,<LENGTH>

e.g.: AT+MMSIMG= 0, 65535

OK

… //transferring data

OK

Description:

Coding types are 0 and 1 which indicates .jpg and .gif formats. Its length and the MMS total length cannot be over 300,000 bytes or it will quit with error. Input this command and wait for the OK returned. Then import data via series tool and get OK returned again at the end of command processing. The content will not be saved without power. This step can be skipped if not editing image content.

2.3.6 Edit MMS Voice Content (optional)

AT+MMSAUD=<TYPE>,<LENGTH>

e.g.: AT+MMSAUD= 0, 50000

OK

… //transferring data

OK

Description:

Coding types are 0, 1 and 2 which indicates MIDI, AMR and WAV formats. Its length cannot be over 64Kb and the MMS total length cannot be over 300,000 bytes or it will quit with error. Input this command and wait for the OK returned. Then import data via series tool and get OK returned again at the end of command processing. The content will not be saved without power. This step can be skipped if not editing image content.

2.3.7 Send MMS

AT+MMSSEND=<DA>,<SUB>,<TEXT>,<IMAGE>,<AUDIO>

e.g.: AT+MMSSEND="13902965084",1,1,0,0

OK // parameter is correct and ready to send

OK // send successfully

Description:

Module receives this command and evaluates if the parameter is correct. If it is incorrect, it returns ERROR and ends the command processing. If it is correct, it will return OK and package the module data to send. The sending time and data size is affected by the network. Generally, it takes about 60 seconds to send a 60Kb MMS and returns OK for success or ERROR for failure. Once the text, image and voice data are imported into module, they will be stored unless power down or re-import. The MMS sending can be optional with the setting of parameter switch.

2.3.8 Procedure Conclusion

Config server → import sending data → package data → connect server → send → end

2.3.9 MMS Receiving Command

Wait...AT command ready

+SIM READY //wait for the ready of SIM card

AT+CGMR //query software version for technical support

+CGMR: "G610_V0C.00.0D"

OK

AT+MMSSERVER="cmwap","http://mmsc.monternet.com/" ,"10.0.0.172",9201

//set MMS connection of CMMC, server, gateway and port number

OK

+MSTI: "SM",18,"MMS PUSH" //Module receives PUSH message alarm

AT+MMSRDPUSH=18 //Read PUSH message. "18" is the index number.

+MMSRDPUSH:
"18901073878","QJ4ERiqKTJTI","http://221.179.185.231/QJ4ERiqKTJTI","11/07/16,09:56:04+32",75631

//Send phone number, MMS ID number, saved position, date, time and data size.

OK

AT+MMSRECV=18 //Download MMS from server. "18" is the index number.

+MMSRECV: "18901073878","11/07/16,09:56:04+32",75631

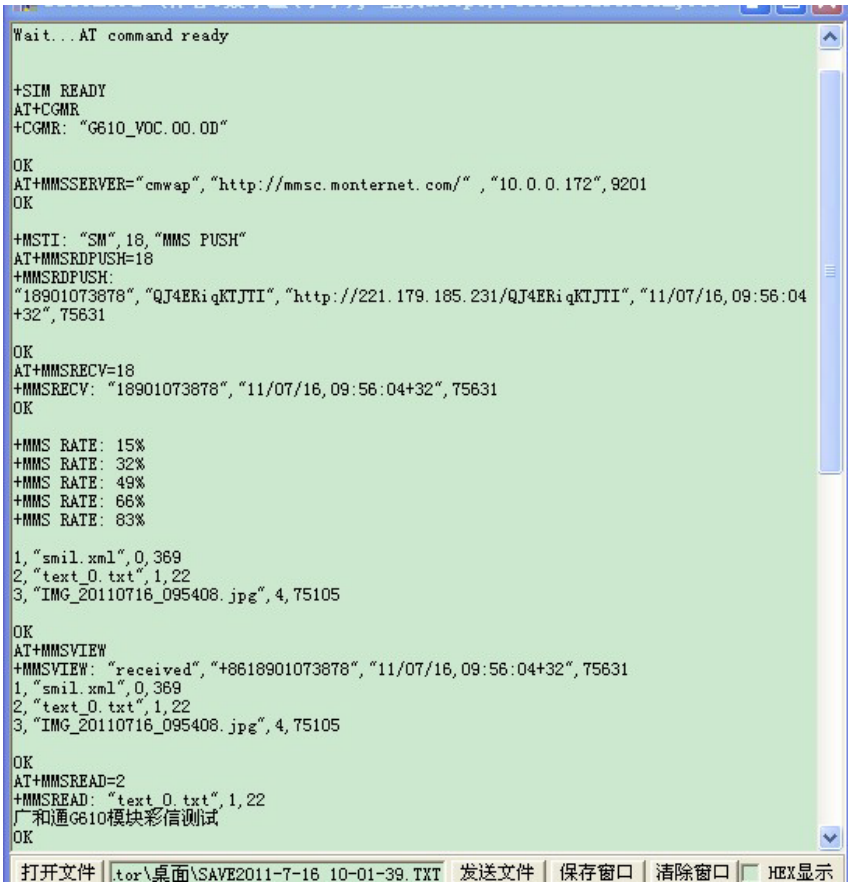
```
            //Send phone number, date, time and data size.
OK

+MMS RATE: 15%              //it will show the process situation because the data is large and takes much
                              time for downloading.
+MMS RATE: 32%
+MMS RATE: 49%
+MMS RATE: 66%
+MMS RATE: 83%

1,"smil.xml",0,369          //unknown content
2,"text_0.txt",1,22         //text information and its size
3,"IMG_20110716_095408.jpg",4,75105    //image in .jpg format and its size
OK
AT+MMSVIEW                  //it shows the MMS content information saved in module. Here will show
                              the just received.
+MMSVIEW: "received","+8618901073878","11/07/16,09:56:04+32",75631
1,"smil.xml",0,369
2,"text_0.txt",1,22
3,"IMG_20110716_095408.jpg",4,75105
OK
AT+MMSREAD=2      //read the MMS text content. "2" is the index number.
+MMSREAD: "text_0.txt",1,22        //text info name, data type and size
G&T's G610 module MMS test      //text content
OK
AT+MMSREAD=3      //read the MMS image content. "3" is the index number.
+MMSREAD: "IMG_20110716_095408.jpg",4,75105    //image name, data type and size.
        //The followed data is the image content, please saved as the same format file.
```

Screenshot of MMS

Screenshot of AT command



2.4 New Command for Embedded TCP/IP Protocol Stack

2.4.1 %ETCPIP

This command implements the PDP activation and TCP/IP initialization. Please set PDP parameter 1 with +CGDCONT command before using this command.

Note: G600 module contains two sets of embedded protocol stacks which is conflicted with each other and cannot be used at the same time.

Command	Syntax	Response/Action	Remarks
Set	%ETCPIP[=[<user_name>],[<password>],[<cid>]]	OK or: ERROR	This command implements the PDP activation and TCP/IP initialization.
Read	%ETCPIP?	%ETCPIP:<state>[,[<local_ip>],[<gate>],[<DNS1>],[<DNS2>]] OK	Query PDP current condition.
Test	%ETCPIP=?	%ETCPIP:(list of <stat>) OK	Query stat range list

Detail parameter instruction

<Parameter>	Description
<user_name>	character string within 31 bytes, can leave empty
<password>	character string within 31 bytes, can leave empty
<cid>	1: can only be 1 here and same configuration as +CGDCONT. Can leave empty.
<state>	0: failed to dial 1: succeed to dial
<local_ip>	Local IP
<gate>	Gateway IP
<DNS1>	Default DNS address
<DNS2>	Backup DNS address

Example:

AT%ETCPIP?

%ETCPIP: 0

OK

AT%ETCPIP=?

%ETCPIP:(0,1)

OK

AT+CGDCONT=1,"IP","CMNET"

OK

AT%ETCPIP=,,1

OK

AT%ETCPIP?

%ETCPIP:1,10.133.177.16,,211.136.20.203,211.136.20.203

OK

2.4.2 %IPOPEN

Open NO.1 link in single link mode.

Command	Syntax	Response/Action	Remarks
Set	%IPOPEN=<type>,<dest_ip>,<dest_port>,[[<udp_dest_send_port>],[<local_port>]]	OK or: ERROR	Open NO.1 link in single link mode.
Read	%IPOPEN?	%IPOPEN:[<type>,<dest_ip>,<dest_port>,<local_port>,[<udp_dest_send_port>]] OK or: ERROR	Query NO.1 link condition in single link mode.
Test	%IPOPEN=?	%IPOPEN: (list of type) OK or ERROR	Query for the available link type.

Detail parameter instruction

<Parameter>	Description
<Dest_ip>	Target IP

<Dest_port>	Target port number: 1~65535
<udp_dest_send_port>	White list for end port number: 0~65535. It can only set one for the port and is valid in UDP link. Can leave it empty which means not filtering the end port.
<local_port>	Local port number: 1~65535. Can leave it empty for random number.
<type>	Link type: "TCP","UDP"

Example:

AT%IPOPEN?

%IPOPEN:

OK

AT%IPOPEN=?

%IPOPEN:("TCP","UDP")

OK

AT%IPOPEN="TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPOPEN?

%IPOPEN: TCP, 61.144.175.231, 3000, 4098

OK

2.4.3 %IPOPENX

Open the link in multiple links mode.

Command	Syntax	Response/Action	Remarks
Set	%IPOPENX=<link_num>,<type>,<dest_ip>,<dest_port>,[[<udp_dest_send_port>],[<local_port>]]	CONNECT or: ERROR	Open the link in multiple links mode.
Read	%IPOPENX?	%IPOPENX:[<link_num1>,<type>,<dest_ip>,<dest_port>,<local_port>[,<udp_dest_send_port>]]	Query the link condition of connection in multiple links mode.

		<cd><cr> [<link_num2>,<type>,<dest_ip>,<dest_port>,<local_port>[,<udp_dest_send_port>]] <cd><cr> [<link_num3>,<type>,<dest_ip>,<dest_port>,<local_port>[,<udp_dest_send_port>]] <cd><cr> OK or: ERROR	
Test	%IPOPENX=?	%IPOPENX: (list of <link_num>), (list of type) OK or: ERROR	Query for the available link type and number range.

Detail parameter instruction

<Parameter>	Description
<Dest_ip>	Target IP
<Dest_port>	Target port number: 1~65535
<udp_dest_send_port>	White list for end port number: 0~65535. It can only set one for the port and is valid in UDP link. Can leave it empty which means not filtering the end port.
<local_port>	Local port number: 1~65535. Can leave it empty for random number.
<type>	Link type: "TCP","UDP"
<link_num >	Link number: 1~3

Example:

AT%IPOPENX?

IPOPENX:

1

2

3

OK

AT%IPOPENX=?

%IPOPENX:(1-3), ("TCP","UDP")

OK

AT%IPOPENX=1,"TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPOPENX?

IPOPENX:

1, TCP, 61.144.175.231, 3000, 4099

2

3

OK

2.4.4 %IOMODE

Set the working mode of protocol stack which can only be used when all links are not activated.

Command	Syntax	Response/Action	Remarks
Set	%IOMODE=[<n>],[<link_flag>],[<buffer_flag>]	OK or: ERROR	Set the working mode of protocol stack which can only be used when all links are not activated.
Read	%IOMODE?	%IOMODE: <n>,<link_flag>,<buffer_flag> OK	Query the current working mode of protocol stack.
Test	% IOMODE =?	%IOMODE: (list of <n>), (list of <link_flag>),(list of <buffer_flag>) OK	Query the available working mode parameter for protocol stack.

Detail parameter instruction

<Parameter>	Description
<n>	0: no conversion on importing and outputting data;

	1: Convert the import and output data (default).
<link_flag>	1: Single link mode. (default); 2: Multiple links mode.
<buffer_flag>	0: buffer on; 1: buffer off (default).

2.4.5 %IPSEND

Send data in single link mode.

Command	Syntax	Response/Action	Remarks
Set	%IPSEND=<data>	[%IPSEND:<link_num>,<tx_window>] OK or: ERROR	Send data via opened No.1 link in single link mode. In non-conversion mode, the largest length of DATA is 1024 bytes which cannot contain the conflict characters with AT command like ", " and =, etc. In conversion mode, the largest length of DATA is 2048 bytes.
Read	%IPSEND?	[%IPSEND:<link_num>,<tx_window>] OK or: ERROR	In single link mode, query the available buffer block quantity of No.1 link.

Detail parameter instruction

<Parameter>	Description
<Dest_ip>	Target IP
<Link_num>	Opened link number, here is 1.
< Tx_window >	Size of sending window. It indicates how many packets that user can sent continuously: 0~16

Example:

AT%IOMODE=1,1,1

OK

AT%IPOPEN="TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPSEND="313131"

OK

%IPSEND: 1,16

%IPDATA: 3,"313131"

AT%IPSEND?

%IPSEND: 1,16

OK

AT%IPCLOSE=1

%IPCLOSE: 1

OK

AT%IOMODE=0,1,1

OK

AT%IPOPEN="TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPSEND="313131"

OK

%IPSEND: 1,16

%IPDATA: 6,"313131"

2.4.6 %IPSENDX

Send data in multiple links mode.

Command	Syntax	Response/Action	Remarks
Set	%IPSENDX=<data>	[%IPSENDX:<link_num>,<tx_window>] OK or: ERROR	Send data via opened No.1 link in multiple links mode. In non-conversion mode, the largest length of DATA is 1024 bytes which cannot contain the conflict characters with AT command like “, ” and =, etc. In conversion mode, the largest

			length of DATA is 2048 bytes.
Read	%IPSENDX?	[%IPSENDXv<link_num1>,<tx_window>] [%IPSENDX:<link_num2>,<tx_window>] [%IPSENDX:<link_num3>,<tx_window>] OK or: ERROR	In multiple links mode, query the available buffer block quantity of link.

Detail parameter instruction

<Parameter>	Description
<Dest_ip>	Target IP
<Link_num>	Opened link number, here is 1.
< Tx_window >	Size of sending window. It indicates how many packets that user can sent continuously: 0~16

Example:

AT%IOMODE=0,2,1

OK

AT%IPOPENX=1,"TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPSENDX=1,"313131"

OK

%IPSENDX: 1,16

%IPDATA: 1,6,"313131"

AT%IPSENDX?

%IPSEND: 1,16

%IPSEND: 2,16

%IPSEND: 3,16

OK

AT%IPCLOSE=1

%IPCLOSE: 1

OK

AT%IOMODE=1,2,1

OK

AT%IPOPENX=1,"TCP","SZGPS.XICP.NET",3000

CONNECT

AT%IPSENDX=1,"313131"

OK

%IPSENDX: 1,16

%IPDATA: 1,3,"313131"

2.4.7 %IPCLOSE

Close connection and monitor. Disconnect GPRS dialing.

Command	Syntax	Response/Action	Remarks
Set	%IPCLOSE=[<cid>][,<Mode>]	%IPCLOSE:<cid> OK or: ERROR	Close connection and monitor. Disconnect GPRS dialing.
Read	%IPCLOSE?	%IPCLOSE:<link1_state>,<link2_state>,<link3_state> OK	Query the link condition of three links.
Test	%IPCLOSE=?	%IPCLOSE:(list of <cid>),(list of <Mode>) OK	Query the parameter list supported by command.

Detail parameter instruction

<Parameter>	Description
< cid>	1~3: corresponding to three operational links; 5: quit TCP/IP function and disconnect GPRS dialing; 6: close the monitor.
< Linkn_state >	0: off; 1: connected.

< Mode >	0: non-force quit; 1: force quit. TCP connection will not wait end port for approve.

2.4.8 %TXSTATE

Clear statistics data of specific link.

Command	Syntax	Response/Action	Remarks
Set	%TXSTATE=[<link_num>]	OK or: ERROR	Clear statistics data of specific link.
Read	%TXSTATE?	%TXSTATE: <link_num 1>,<send_sum>,<ack_sum> <link_num 2>,<send_sum>,<ack_sum> <link_num 3>,<send_sum>,<ack_sum> OK	Query statistics data of specific link.
Test	%TXSTATE=?	%TXSTATE:(list of <link_num>) OK	Query the parameter list supported by command.

Detail parameter instruction

<Parameter>	Description
< link_num >	1~3: corresponding to three operational links;
<send_sum>	Sending packet amount of TCP link;
<ack_sum>	End port approved packet amount of TCP link.

Example:

AT%TXSTATE?

%TXSTATE:

1,1,1

2,0,0

3,0,0

OK

AT%TXSTATE=?

%TXSTATE: (1,3)

OK

AT%TXSTATE=1

OK

AT%TXSTATE?

%TXSTATE:

1,0,0

2,0,0

3,0,0

OK

2.4.9 %IPDQ

Query the received information of buffer.

Command	Syntax	Response/Action	Remarks
Set	%IPDQ	%IPDQ:<unread_sum>,<packet-sum> OK or: ERROR	Query the received information of buffer.

Detail parameter instruction

<Parameter>	Description
< unread_sum >	unread packet amount
< packet-sum >	Buffer packet amount including read and unread.

2.4.10 %IPDR

Read the data in buffer.

Command	Syntax	Response/Action	Remarks
Set	%IPDR =[<index>]	%IPDR:<link_num>,<data_index>,<data_len>,<data> OK or:	Read the [N]th packet of buffer data. Leave index empty means N=1. In auto-delete mode, it will delete

		ERROR	read-data from buffer.

Detail parameter instruction

<Parameter>	Description
< index >	Buffer packet SN: 0~50. Both 0 and 1 indicate packet 1. Leave index empty means packet 1.
< link_num >	Link number of receiving data: 1~3
< data_index >	Buffer packet number: corresponding to index
<data_len>	Data length
<data>	data

2.4.11 %IPDD

Delete the data in buffer.

Command	Syntax	Response/Action	Remarks
Set	%IPDD=[<index>],[<type>]	%IPDD:<del_num> OK or: ERROR	Delete the data in buffer.

It will delete the current read packet 1 data if all parameters are default.

Detail parameter instruction

<Parameter>	Description
< index >	Buffer packet SN: 0~50. 0 has specific meaning.
<type>	Only effective when index=0: 0: delete read; 1: delete unread; 2: delete all.
<del_num>	Delete data packet number

2.4.12 %IPDDMODE

Setting command for data delete mode.

Command	Syntax	Response/Action	Remarks
Set	%IPDDMODE=<mode>	%IPDDMODE:<mode> OK or: ERROR	Set the delete mode for buffer packet. This command cannot be used when a link is activated.
Read	%IPDDMODE?	%IPDDMODE:<mode> OK	Query the current delete mode of buffer packet.
Test	%IPDDMODE=?	%IPDDMODE:(list of <mode>) OK	Query the parameter list supported by command.

Detail parameter instruction

<Parameter>	Description
< mode >	0: delete automatically (default); 1: delete manually.

Example:

AT%IPDDMODE?

%IPDDMODE: 0

OK

AT%IPDDMODE=?

%IPDDMODE: (0,1)

OK

AT%IPDDMODE=1

OK

AT%IPDDMODE?

%IPDDMODE: 1

OK

2.4.13 %IPLISTEN

Turn on monitor.

Note: server does not support single link so it will turn to be multiple links after entering server mode, which can monitor at most 3 clients. This command cannot be used when listen-port has been occupied by the same type of link.

Command	Syntax	Response/Action	Remarks
Set	%IPLISTEN=<type>,<listen_port>	OK or: ERROR	Turn on monitor.
Read	%IPLISTEN?	%IPLISTEN:<type>,<listen_port>,<idle_num> OK	Query the current monitor configuration which is in used.

Detail parameter instruction

<Parameter>	Description
<type>	Monitor type: "TCP""UDP"
<listen_port>	Monitor port number: 1~65535
<idle_num>	Free links number: 0-3. It indicates how many remote links can be accessed.

Example:

AT%IPLISTEN="TCP",2222

OK

AT%IPLISTEN?

%IPLISTEN: TCP,2222,0

OK

2.4.14 %IPSP

Set the delay sending parameter.

Command	Syntax	Response/Action	Remarks
Set	%IPSP=<msel>	OK or: ERROR	Set the delay sending parameter.
Read	%IPSP?	%IPSP: <msel>,<data_num> OK	Query the configuration of current delay sending

			parameter.
Test	%IPSP=?	%IPSP: (list of <msel>) OK	Query the parameter list supported by command.

Detail parameter instruction

<Parameter>	Description
<msel>	0: close the delay sending 500-60000: delay [x] seconds to send
<data_num>	Left buffer space.

Example:

AT%IPSP?

%IPSP: 0,0

OK

AT%IPSP=?

%IPSP:(0,500-60000)

OK

AT%IPSP=5000

OK

AT%IPSP?

%IPSP: 5000,0

OK

2.4.15 %DNSR

DNS (domain name resolution)

Command	Syntax	Response/Action	Remarks
Set	%DNSR=<host_name>,[<server_ip>]	%DNSR:<IP> OK or: ERROR	DNS

Detail parameter instruction

<Parameter>	Description
<host_name>	Domain name with character string less than 128 bytes.
<server_ip>	DNS address
<IP>	IP address

Example:

AT%DNSR="www.sina.com.cn"

%DNSR:221.179.180.83

OK

2.4.16 %TPS

Enter pass-through mode via specific link.

Command	Syntax	Response/Action	Remarks
Set	%TPS=<mode>,<link_num>,<timeout_val>,<bufferfull_val>	CONNECT or: ERROR	Set the opened link as pass-through mode. The pass-through mode can only be set to one link once upon a time.
Read	%TPS?	%TPS:<mode>,<link_num>,<timeout_val>,<bufferfull_val> OK	Query the current configuration parameter of pass-through functionality.
Test	% TPS =?	%TPS:(lsit of <mode>),(lsit of <link_num>),(lsit of <timeout_val>),(lsit of <bufferfull_val>) OK	Query the parameter list supported by command.

Detail parameter instruction

<Parameter>	Description
<mode>	0: non-pass-through mode; 4: automatic mode
<link_num>	Used link number: 1~3

<timeout_val>	Temporarily disabled
<bufferfull_val>	Temporarily disabled

Example:

AT%TPS=4,1,1000,1024

CONNECT

SADJFKLSJADKLFJ

OK

AT%TPS=4,1,1000,1024

CONNECT

+++

AT%TPS?

%TPS: 0,1,1000,1024

OK

AT%TPS=?

%TPS: (0, 4),(1-3),(1000-600000),(512-1024)

OK

2.4.17 Unsolicited Result Code %IPDATA

Report the received data.

In single link mode, module reports data automatically:

%IPDATA:<len>,<data>

In multiple links mode, module reports data automatically:

%IPDATA:<link_num>,<len>,<data>

In buffer mode, module reports data automatically:

%IPDATA:<link-num>,<index>,<len>

Detail parameter instruction

<Parameter>	Description
<len>	Data length
<data>	Data

<link_num>	Link number
<index>	SN saved in buffer

2.4.18 Unsolicited Result Code %IPCLOSE

Report the disconnect information

%IPCLOSE:<cid>

Detail parameter instruction

<Parameter>	Description
<cid>	Link number

2.4.19 Working Examples in Multiple Links Mode

AT+CGDCONT=1,"IP","CMNET" //need to set CGDCONT

OK

AT%ETCPIP=?

%ETCPIP:(0,1)

OK

AT%ETCPIP //PDP activation

OK

AT%ETCPIP?

%ETCPIP: 1,10.111.119.188,,120.196.165.7,221.179.38.7

OK

AT%IOMODE=1,2,1 //set the multiple links mode. The second parameter (“2”) indicates the links number. If it is set as “1”, it indicates single link mode.

OK

AT%IPOPENX=1,"TCP","SZGPS.XICP.NET",3000 //open SOCKET1 by TCP. Changing “TCP” to “UDP” indicates open SOCKET by UDP.

CONNECT

AT%IPSENDX=1,"AdBFcc03" //SOCKET1 sends data

```
%IPSENDX:1,15
OK
%IPDATA:1,4,"ADBFCC03"          //SOCKET1 receive data

AT%IPOPENX=2,"TCP","SZGPS.XICP.NET",3000
CONNECT
AT%IPSENDX=2,"0d7d190a"
%IPSENDX:2,15
OK
%IPDATA:2,4,"0D7D190A"

AT%IPOPENX=3,"TCP","SZGPS.XICP.NET",3000    //no more than 3 SOCKET can be opened.
CONNECT
AT%IPSENDX=3,"5C90E115"
%IPSENDX:3,15
OK
%IPDATA:3,4,"5C90E115"

AT%IPCLOSE=3                    //close SOCKET in order from 3 to 1
%IPCLOSE: 3
OK
AT%IPCLOSE=2
%IPCLOSE: 2
OK
AT%IPCLOSE=1
%IPCLOSE: 1
OK
AT%IPCLOSE=5                    //de-activate PDP
%IPCLOSE: 5
OK
```

2.5 FTP

2.5.1 Overview

G600 implements FTP connection feature, based on RFC959 standard, and operates as a FTP client. When connected to a remote FTP server, G600 is able to receive information about remote file system, manage it and perform files transfer operations.

2.5.2 Manage FTP Connection

AT+FTPOPEN command is used to open a FTP connection with a remote FTP server. When G600 performs FTP connection establish procedure, it allocates two TCP sockets. One of them is used for FTP control channel, the other - for FTP data channel (listen mode). FTP control channel port has default identification number (ID) - 21 for source (client) and destination (server) sides, but user is able to configure control channel port ID for client as well as for server by pass new source control port and/or new destination control port id as AT+FTPOPEN command optional parameters. This is applicable, when remote FTP server able to accept FTP connection over non-standard (other, then 21) ports. FTP data channel port has default identification number (ID) -20 for source (client) side, but user be able to configure data channel port id by pass new source data port id as AT+FTPOPEN command optional parameter. This is applicable, when remote FTP server unable to establish data connection to some port IDs. Following example shown how to use AT+FTPOPEN command in various situations.

To open a FTP connection with a remote FTP server, use the following settings:

destination URL	= someftpsite.com	(mandatory)
user	= anonymous	(mandatory)
password	= qwerty@email.com	(mandatory)
account	= ""	(optional, default value)
source control port id	= 21	(optional, default value)
destination control port id	= 21	(optional, default value)
source data port id	= 20	(optional, default value)

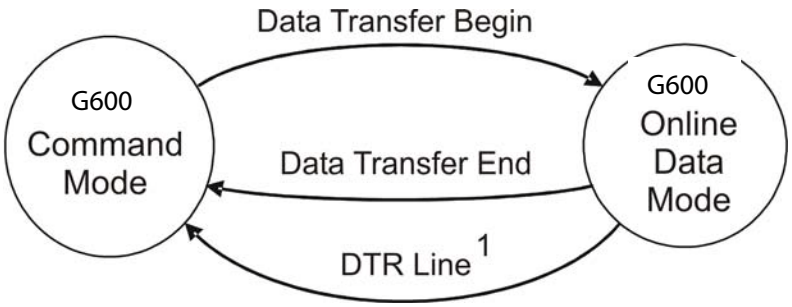
AT+FTPOPEN = "someftpsite.com","anonymous","qwerty@somemail.com",,,,

To open a FTP connection with a remote FTP server, use the same mandatory settings, but customize source control and data ports id:

source control port id	= 1300	(optional, default value)
destination control port id	= 21	(optional, default value)
source data port id	= 1302	(optional, default value)

AT+FTPOPEN = "someftpsite.com","anonymous","qwerty@somemail.com",,1300,,1302

When FTP connection establish, G600 remains in command mode. This mode used for performing most of FTP AT commands. Only AT+FTPLIST, AT+FTPSTOR and AT+FTPRETR commands switch G600 to online data mode. Generally, G600 returns to command mode after the data mode caused command execution finished, but user be able to interrupt online data mode (and close actual FTP connection) by change DTR line status from ON to OFF, when AT&D settings = 2 or 3. The G600 operation modes switching is shown in below figure.



Note: AT&D settings = 2 or 3. The operation closes actual FTP connection and switches G600 to command mode. AT&D settings = 1 does not affect.

Established FTP connection can be closed when G600 is in command mode by AT+FTPCLOSE command or by changing DTR line status from ON to OFF when data transfer operations is performed (G600 is in online data mode).

2.5.3 Manage Remote File System

When FTP connection is established, the user is able to manage file system on the remote FTP server, like create, remove, change directory, rename or delete a file. The following FTP commands are used for remote file system management purpose.

+FTPCWD - changes working directory on remote server.

+FTPMKD - create a new directory on remote server.

+FTPRMD - removes existing directory on remote server.

+FTPPWD - returns actual working directory name from remote server.

+FTPCDUP - changes working directory on remote server up to parent directory.

+FTPDEL - delete a file on remote server.

+FTPREN - rename a file on remote server.

2.5.4 File Transfer Operations

The file transfer operation allows the user to transfer a file over an established FTP connection. To avoid end-of-file detection problem for user in download case and for G600 in upload case, G600 implements a special format of transferred files over FTP connection. The format proposed "escaping" one of ASCII symbols from file context and using the "escaped" symbol as end-of-file marker. An escaping algorithm described below.

The algorithm defines two special characters: EOF (end-of-file character) and ESC (escape character). EOF

symbol is hexadecimal 0x03 (decimal 3) ASCII ETX symbol and ESC symbol is hexadecimal 0x10 (decimal 16) ASCII DLE symbol - not to be confused with the ASCII ESCape character.

To encode a file to FTP File Transfer Format, the user or G600 shall read each data byte from source file and perform following operation:

- When a data byte has the same code as EOF character, a two byte sequence of ESC and EOF characters is sent instead.
- When a data byte has the same code as ESC character, a two byte sequence of ESC and ESC characters is sent instead.
- When end of file is reach, EOF character is sent.

To decode a file from FTP File Transfer Format, the user or G600 shall read each data byte from source file and perform following operation:

- When a data byte has the same code as ESC character and next data byte is ESC or EOF character, the first byte should be ignored.
- When a data byte has the same code as EOF character and previous data byte is not ESC character, end of file is reach.

2.5.5 Other FTP Operations

G600 provides +FTPINFO feature, allows user to receive more information about FTP connection and FTP commands execution. When the feature enables, all FTP commands, send by G600 to remote server and all FTP responses, receives by G600 from remote server are prints to user as +FTPINFO: <text> unsolicited response. Use AT+FTPINFO=1 for the feature enable, and AT+FTPINFO=0 for the feature disable in any G600 operation time, when G600 is in command mode.

2.5.6 Interaction with +MIPODM Command

The external ODM session is prohibit when FTP feature executed, because FTP feature data connection based on socket, opened for ODM (internal ODM session), so when G600 receives +MIPODM command within FTP connection, the error code: 302 (FTP session is active) returns to user.

2.5.7 Interaction with +MIPOPEN and +MIPCLOSE Commands

User cannot initiate FTP connection with +MIPOPEN command as well as close FTP connection with +MIPCLOSE command. However, +MIPOPEN and +MIPCLOSE commands in "read" state still indicate actually used / unused sockets include sockets, allocated for active FTP connection:

- AT+MIPOPEN? indicates inactive sockets (include allocated for active FTP connection)
- AT+MIPCLOSE? indicates active sockets (include allocated for active FTP connection)

When G600 receives +MIPCLOSE command for close a socket, used within FTP connection, the error code: 302 (FTP session is active) returns to user.

2.6 AT Commands Reference for FTP

2.6.1 +FTPOPEN, Open FTP Connection between G600 (FTP client) and Remote FTP Server

This command causes G600 to open a FTP connection with a remote FTP server, based on given parameters.

Notes:

- Only one FTP connection can be in progress at the same time.
- FTP connection is based on two TCP sockets: one of them configured for Online Data Mode.
- Online Data connection is prohibited when FTP connection is in progress and vice versa.

Command	Syntax	Response/Action	Remarks
Set	+FTPOPEN= <"destination_ip/ url ">,<"username">, <"password">[,<" ac count">,<source_ con trol_port>,<destin ation on_control_port>, <source_data_por t>]	OK +FTPOPEN: <connection_status> Or: ERROR: <error_code>	Command execution result (connection status) return to the user as an unsolicited response: 1 - connection success 0 - connection fail
Read	+FTPOPEN?	+FTPOPEN: <connection_status> OK	Returns FTP connection status: 1 - connection success 0 - connection fail
Test	+FTPOPEN=?	+FTPOPEN: (<destination_ip/url>), (<username>),(<password>) [,(<account>), (range of supported port's), (range of supported port's), (range of supported port's)] OK	Returns command format.

The following table shows the +FTPOPEN parameters.

<Parameter>	Description	Range
destination_ip/url1	IP or URL of remote FTP site.	IP address in dotted decimal notation form: XXX.XXX.XXX.XXX. URL: ASCII chars, max length is 255

		octets.
username2	Username for FTP login procedure.	ASCII chars, max length is 255 octets.
password3	Password for FTP login procedure.	ASCII chars, max length is 255 octets.
account4	User Account for FTP login procedure.	ASCII chars, max length is 255 octets.
source_control_port5	Port for FTP control connection on source side.	Number in 0-65535 range.
destination_control_port5	Port for FTP control connection on remote side.	Number in 0-65535 range.
source_data_port6	Port for FTP data connection on source side.	Number in 0-65535 range.

Example:

The first example illustrates FTP connection open success case.

AT+FTPOPEN="someftpsite.com","anonymous","qwerty@somemail.com",,,,

OK

+FTPOPEN: 1

The second example illustrates FTP connection open error case, because another FTP connection is already opens. The AT+CMEE=2 command enables verbose error report.

AT+CMEE=2

OK

AT+FTPOPEN="someftpsite.com","anonymous","qwerty@somemail.com",,,,

OK

+FTPOPEN: 1

AT+FTPOPEN="anotherftpsite.com","anonymous","qwerty@somemail.com",,,,

+CME ERROR: FTP session is active

2.6.2 +FTPCLOSE, Close Established FTP Connection between G600 (FTP client) and Remote FTP Server

This command causes G600 to close FTP connection, when no data transfer occurred at that same time. When data transfer is in progress, use DTR line for closing FTP connection.

Command	Syntax	Response/Action	Remarks
Set	+FTPCLOSE	OK +FTPCLOSE:	Command execution result return to the user as an unsolicited response:

		<connection_status> Or: ERROR: <error_code>	1 - connection success 0 - connection fail
Read	+FTPCLOSE?	ERROR	Not supported
Test	+FTPCLOSE=?	ERROR	Not supported

Example：

The first example illustrates FTP connection close success case.

AT+FTPCLOSE OK +FTPCLOSE: 1 The second example illustrates FTP connection close error case, because no FTP connection was opened. The

AT+CMEE=2 command enables verbose error report.

AT+CMEE=2 OK

AT+FTPCLOSE +CME ERROR: FTP session is inactive

2.6.3 +FTPINFO, FTP Unsolicited Indication Enable/Disable

This command causes the G600 to enable or disable FTP unsolicited indication to the user. FTP unsolicited indication is used for debugging the FTP session and, when the indication is enabled, the G600 will show to user all FTP commands, send to remote site and all FTP responses received from the remote side.

Command	Syntax	Response/Action	Remarks
Set	+FTPINFO=<indication>	OK Or: ERROR: <error_code>	Enables/disables FTP unsolicited indication: 0 - Indication disabled 1 - Indication enabled When indication is enabled, G600 will send the user all FTP commands and responses by the following unsolicited response format: +FTPINFO: <data>
Read	+FTPINFO?	+FTPINFO: <indication> OK	Returns FTP indication status: 0 - Indication disabled 1 - Indication enabled
Test	+FTPINFO=?	+FTPINFO: (range of supported <indication_status>s) OK	Return command format.

The following table shows the +FTPINFO parameters.

<Parameter>	Description	Range
Indication status	FTP unsolicited indication status.	Numeric in 0-1 range.

Example：

The example illustrates FTP connection open success case, when FTP unsolicited indication is enabled.

AT+FTPINFO=1 OK AT+FTPOPEN="someftpsite.com","anonymous","qwerty@somemail.com",,,,

OK +FTPINFO: 220+FTPINFO: 220-Welcome to someftpsite.com! +FTPINFO: 220+FTPINFO: 220 someftpsite.com FTP server (SecureMb FTP Version 1.0) ready. +FTPINFO: USER anonymous +FTPINFO: 331 Guest login ok, send your complete e-mail address as password. +FTPINFO: PASS qwerty@somemail.com +FTPINFO: 230 Guest login ok, access restrictions apply. +FTPOPEN: 1

2.6.4 +FTPCWD, Change Working Directory

This command causes the G600 to request the remote FTP server to change the working directory in accordance to a given name.

Command	Syntax	Response/Action	Remarks
Set	+FTPCWD=<directory_name>	OK +FTPCWD: <result> Or: ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPCWD?	ERROR	Not supported
Test	+FTPCWD=?	+FTPCWD: (<"directory name">) OK	Returns command format.

The following table shows the +FTPCWD parameters.

<Parameter>	Description	Range
Directory name	Name of directory to be changed on the remote side.	String, max length is 255 octets.

Example:

The first example illustrates change in working directory success case.

AT+FTPCWD="data" OK +FTPCWD: 1 The second example illustrates change working directory fail case; because the given directory name was

not found on the remote server.

AT+FTPCWD="user" OK +FTPCWD: 0 The third example illustrates change working directory fail case; because no FTP connection was opened.

The AT+CMEE=2 command enables verbose error report.

AT+CMEE=2

OK

AT+FTPCWD="data"

+CME ERROR: FTP session is inactive

2.6.5 +FTPMKD, Make Directory

This command causes the G600 to request the remote FTP server to create a new directory in accordance to a given name.

Command	Syntax	Response/Action	Remarks
Set	+FTPMKD=<directory_name >	OK +FTPMKD: <result> Or: ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPMKD?	ERROR	Not supported
Test	+FTPMKD=?	+FTPMKD: (<"directory name">) OK	Returns command format.

The following table shows the +FTPMKD parameters.

<Parameter>	Description	Range
Directory name	Name of directory to be created on the remote side.	String, max length is 255 octets.

Example:

The first example illustrates make new directory success case.

AT+FTPMKD="somedir" OK +FTPMKD: 1 The second example illustrates makes new directory fail case,

because the directory name already present

on the remote server.

AT+FTPMKD="somedir"

OK

+FTPMKD: 0

2.6.6 +FTPRMD, Remove Directory

This command causes the G600 to request the remote FTP server to remove a directory in accordance to a given name.

Command	Syntax	Response/Action	Remarks
Set	+FTPRMD=<directory_name>	OK +FTPRMD: <result> Or: ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPRMD?	ERROR	Not supported
Test	+FTPRMD=?	+FTPRMD: (<"directory name">) OK	Returns command format.

The following table shows the +FTPRMD parameters.

<Parameter>	Description	Range
Directory name	Name of directory to be removed on the remote side.	String, max length is 255 octets.

Example:

The first example illustrates remove directory success case.

AT+FTPRMD="somedir" OK +FTPRMD: 1 The second example illustrates remove directory fail case, because the directory name was not found on the

remote server. FTP unsolicited indication enabled.

AT+FTPINFO=1

OK

AT+FTPRMD="somedir"

OK +FTPINFO: RMD 1 +FTPINFO: 550 1: No such file or directory. +FTPRMD: 0

2.6.7 +FTPPWD, Print Working Directory

This command causes G600 to request the remote FTP server to return the working directory name.

Command	Syntax	Response/Action	Remarks
Set	+FTPPWD	OK ... +FTPPWD: <result>[,<directory_name>] or ERROR: <error_code>	<directory_name> parameter consists of the directory name as well as the directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success 2 - text message follows <directory_name> parameter follows only when <result> = 2
Read	+FTPPWD?	ERROR	Not supported
Test	+FTPPWD=?	ERROR	Not supported

Example:

The example illustrates print working directory success case.

AT+FTPPWD OK

+FTPPWD: 2, "/home/somedir" is current directory. +FTPPWD: 1

2.6.8 +FTPCDUP, Change Directory Up

This command causes the G600 to request the remote FTP server to change the working directory up.

Command	Syntax	Response/Action	Remarks
Set	+FTPCDUP	OK ... +FTPCDUP: <result> or ERROR: <error_code>	The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPCDUP?	ERROR	Not supported
Test	+FTPCDUP=?	ERROR	Not supported

Example:

The example illustrates change working directory up success case.

AT+FTPCDUP OK +FTPCDUP: 1

2.6.9 +FTPDEL, Delete File

This command causes the G600 to request the remote FTP server to delete a file, in accordance to a given name.

Command	Syntax	Response/Action	Remarks
Set	+FTPDEL=<file_name>	OK ... +FTPDEL: <result> or ERROR: <error_code>	<file_name> parameter consists of the file name as well as the file path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPDEL?	ERROR	Not supported
Test	+FTPDEL=?	+FTPDEL: (<"file name">) OK	Return command format

The following table shows the +FTPDEL parameters.

<Parameter>	Description	Range
File name	Name of file to be deleted on the remote side.	String, max length is 255 octets.

Example:

The example illustrates delete file success case.

AT+FTPDEL="somefile" OK +FTPDEL: 1

2.6.10 +FTPREN, Rename File

This command causes the G600 to request the remote FTP server to rename a file, in accordance to given parameters.

Command	Syntax	Response/Action	Remarks
Set	+FTPREN=<file_name_from>,	OK ... +FTPREN: <result> or ERROR: <error_code>	<file_name_from> and <file_name_to> parameters consists of the file name as

	<file_name_to>		well as the file path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPREN?	ERROR	Not supported
Test	+FTPREN=?	+FTPREN: (<"file name from">), (<"file name to">) OK	Return command format

The following table shows the +FTPREN parameters.

<Parameter>	Description	Range
File name from	Old name of file to be renamed on the remote side.	String, max length is 255 octets.
File name to	New name of file to be renamed on the remote side.	String, max length is 255 octets.

Example:

The first example illustrates rename file success case.

AT+FTPREN="somefile.name","anotherfile.name" OK +FTPREN: 1 The second example illustrates rename file fail case, because the file name was not found on the remote

server. FTP unsolicited indication enabled.

AT+FTPINFO=1 OK AT+FTPREN=" somefile.name","anotherfile.name"

OK +FTPINFO: RNFR somefile.name +FTPINFO: 550 somefile.name: No such file or directory. +FTPREN: 0

2.6.11 +FTPLIST, Request List

This command causes the G600 to request the remote FTP server to send a list, in accordance to a given parameter.

Notes:

- Parameter is optional. When +FTPLIST command without a parameter is entered, G600 requests the remote side to return the last requested list.
- The command execution result returns to the user as an unsolicited response (command mode), as well as a list in data mode.
- When +FTPLIST command is executed, a requested list is being sent to the user when G600 is in data mode, immediately after +FTPLIST: 2 unsolicited response, but before +FTPLIST: 1 unsolicited response.

Command	Syntax	Response/Action	Remarks
Set	+FTPLIST [=<file/directory name>]	OK ... +FTPLIST: <result> <list of directory/files> ... +FTPLIST: <result> or ERROR: <error_code>	Parameter consists of the file/directory name as well as the file/directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success 2 -data follows
Read	+FTPLIST?	ERROR	Not supported
Test	+FTPLIST=?	+FTPLIST: (<"file/directory name">) OK	Return command format

The following table shows the +FTPLIST parameters.

<Parameter>	Description	Range
File/directory name	Name of file or directory on the remote side for list request.	String, max length is 255 octets.

Example:

The first example illustrates get list for specific file success case.

AT+FTPLIST="somefile.name" OK

+FTPLIST: 2 -rw-rw-r-- 1 1001 0 Mar 26 2006 somefile.name

+FTPLIST: 1

The second example illustrates get list for all files success case.

AT+FTPLIST="*.*" OK

+FTPLIST: 2 -rw-rw-r-- 1 1001 129886 Mar 23 06:20 somefile1.name -rw-rw-r-- 1 1001 4968 Jan 8 07:57 somefile2.name -rw-rw-r-- 1 1001 23948 Jan 8 07:32 somefile3.name -rw-rw-r-- 1 1001 0 Feb 7 01:56 somefile4.name -rw-rw-r-- 1 1001 204673 Jan 10 02:28 somefile5.name -rw-rw-r-- 1 1001 9348 Jul 19 2006 somefile6.name

+FTPLIST: 1

2.6.12 +FTPSTAT, Request Status

This command causes the G600 to request the remote FTP server to send status, in accordance to a given parameter.

Note: Parameter is optional. When +FTPSTAT command without a parameter is entered, G600 requests the remote side to return a general system status.

Command	Syntax	Response/Action	Remarks
Set	+FTPSTAT[=<file/directory name>]	OK ... +FTPSTAT: <result>[,<status>] or ERROR: <error_code>	Parameter (optional) consists of directory name as well as directory path (optional). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success 2 - text message follows <status> parameter follows only when <result>=2
Read	+FTPSTAT?	ERROR	Not supported
Test	+FTPSTAT=?	+FTPSTAT: (<"file/directory name">) OK	Return command format

The following table shows the +FTPSTAT parameters.

<Parameter>	Description	Range
File/directory name	Name of file or directory on the remote side for list request.	String, max length is 255 octets.

Example:

When the user enters +FTPSTAT command without parameters, the last requested status within actual FTP connection returns. When there is first status request within actual FTP connection, the remote server returns general FTP connection status, like in the following example:

The first example illustrates +FTPSTAT command without parameter first time (for actual FTP connection) use. In this case general FTP connection status returns.

AT+FTPSTAT OK

+FTPSTAT: 2, SecureMb FTP Version 1.0 +FTPSTAT: 2, Connected to name.provider.com (255.255.255.255) +FTPSTAT: 2, Logged in as anonymous +FTPSTAT: 2, TYPE: ASCII, FORM: Nonprint; STRUcture: File; transfer MODE: Stream +FTPSTAT: 2, No data connection +FTPSTAT: 2, 0 data bytes received in 0 files +FTPSTAT: 2, 0 data bytes transmitted in 0 files +FTPSTAT: 2, 0 data bytes total in 0 files +FTPSTAT: 2, 30 traffic bytes received in 0 transfers +FTPSTAT: 2, 535 traffic bytes transmitted in 0 transfers +FTPSTAT: 2, 614 traffic bytes total in 0 transfers +FTPSTAT: 1

The second example illustrates using +FTPSTAT command with a parameter containing a name of actually present on remote server file. In this case, the specific file status is returned.

AT+FTPSTAT="somefile.name" OK

+FTPSTAT: 2,-rw-rw-r-- 1 1001 653793 May 2 03:33 somefile.name +FTPSTAT: 1

The third example illustrates using +FTPSTAT command with a parameter containing a name of file, which does not exist on the remote server file. In this case, the remote server returns "No such file or directory" string and command is finished successfully.

AT+FTPSTAT="anotherfile.name" OK

+FTPSTAT: 2,/bin/ls: anotherfile.name: No such file or directory +FTPSTAT: 1

The fourth example illustrates using +FTPSTAT command with a parameter containing an illegal file name. In this case, the remote server returns error and FTP connection is closed by the remote side.

AT+FTPSTAT="." OK

+FTPSTAT: 0

+FTPCLOSE: 1

The fifth example illustrates using +FTPSTAT command for receiving the status of all files in the actual working directory.

AT+FTPSTAT="*.*" OK

+FTPSTAT: 2,-rw-rw-r-- 1 1001 129886 Mar 23 06:20 somefile1.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 4968 Jan 8 07:57 somefile2.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 23948 Jan 8 07:32 somefile3.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 0 Feb 7 01:56 somefile4.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 204673 Jan 10 02:28 somefile5.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 9348 Jul 19 2006 somefile6.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 653793 May 2 03:33 somefile7.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 645120 Mar 25 04:27 somefile8.name +FTPSTAT: 2,-rw-rw-r-- 1 1001 0 Mar 26 2006 somefile9.name +FTPSTAT: 1

2.6.13 +FTPSYST, Request Remote FTP Server Operating System Type

This command causes the G600 to request the remote FTP server to send the operating system type.

Command	Syntax	Response/Action	Remarks
Set	+FTPSYST	OK ... +FTPSYST: <result>[,<system>] or ERROR: <error_code>3	The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success 2 - text message follows <system> parameter follows only when <result>=2
Read	+FTPSYST?	ERROR	Not supported
Test	+FTPSYST=?	ERROR	Not supported

Example:

The example illustrates the command execution.

AT+FTPSYST OK

+FTPSYST: 2, UNIX Type: L8 +FTPSYST: 1

2.6.14 +FTPNOOP, No Operation

This command causes the G600 to request the remote FTP server to do nothing (possible use for PING).

Command	Syntax	Response/Action	Remarks
Set	+FTPNOOP	OK ... +FTPNOOP: <result> or ERROR: <error_code>	The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success
Read	+FTPNOOP?	ERROR	Not supported
Test	+FTPNOOP=?	ERROR	Not supported

Example:

The example illustrates the command execution.

AT+FTPNOOP OK +FTPNOOP: 1

2.6.15 +FTPSTOR, Store File on Remote FTP Server

This command causes the G600 to request the remote FTP server to store a file, sent by the G600.

Notes:

- The user can send a file to the G600 only when the G600 returns <result> = 2. In this case, the G600 switches to Online Data Mode and all data sent to RS232 transfers as-is to the remote server.
- Before transferring to the remote side, data file is converted (encoded), see "FTP Connection" on page 1-1. When end-of-file is reached, G600 switches back to Command Mode and return <result> = 1 (success case).
- An error may occur in any stage of file transferring. In this case, G600 switches to Command Mode and <result> = 0 return to the user.

Command	Syntax	Response/Action	Remarks
Set	+FTPSTOR=<file_name>, [<file_type>]	OK ... +FTPSTOR: <result> or ERROR: <error_code>	<file_name> parameter consists of the file name as well as the file path (optional). <file_type> parameter is optional. Default value is 1 (binary). The command execution result return to the

			user as an unsolicited response: 0 - operation fails 1 - operation success 2 - data connection (ODM) enabled
Read	+FTPSTOR?	ERROR	Not supported
Test	+FTPSTOR=?	+FTPSTOR: (<"file name">)[,(0-1)] OK	Return command format

The following table shows the +FTPSTOR parameters.

<Parameter>	Description	Range
File name	Name of file to be stored on the remote side.	String, max length is 255 octets.
File type	Type of file (ASCII or Binary).	Numeric, in the range of 0-1 (0 = ASCII, 1 = Binary).

Example:

The example illustrates the command execution. Requested file type is binary.

AT+FTPSTOR="somefile.name",1

+FTPSTOR: 2 The user sends a file with <end-of-file> here

+FTPSTOR: 1

2.6.16 +FTPRETR, Retrieve a File from a Remote FTP Server

This command causes the G600 to request the remote FTP server to send a file to the G600.

Notes:

- The user can store a file, received from G600 immediately after G600 returns <result> = 2. In this case G600 switches to Online Data Mode and all data, received from RS232 is the requested file.
- The user converts (decode) the received data file for end-of-file detect, see "FTP Connection" on page 1-1. When the remote FTP server closes data connection, G600 switches back to Command Mode and returns <result> parameter = 1 (success case).
- In any stage of file transfer, an error can occurred. In this case, G600 switches to Command Mode and <result> = 0 return to the user.

Command	Syntax	Response/Action	Remarks
Set	+FTPRETR=<file_n	OK ... +FTPRETR: <result>	<file_name> parameter consists of the

	ame>, [<file_type>]	or ERROR: <error_code>	file name as well as the file path (optional). <file_type> parameter is optional. Default value is 1 (binary). The command execution result return to the user as an unsolicited response: 0 - operation fails 1 - operation success 2 - data connection (ODM) enabled
Read	+FTPRETR?	ERROR	Not supported
Test	+FTPRETR=?	+FTPRETR: (<"file name">)[,(0-1)] OK	Return command format

The following table shows the +FTPRETR parameters.

<Parameter>	Description	Range
File name	Name of file to be retrieved from the remote side.	String, max length is 255 octets.
File type	Type of file (ASCII or Binary).	Numeric, in the range of 0-1 (0 = ASCII, 1 = Binary).

Example:

The example illustrates the command execution. Requested file type is binary.

AT+FTPRETR="somefile.name",1

+FTPRETR: 2 .... <ETX>

+FTPRETR: 1

2.6.17 +FTPREST, Set the Offset of the Download File

This command sets the offset of the download file. The following command: FTPRETR or FTPGET will download data from the file specified location instead of download the entire file.

Notes: The offset must be less than the length of the downloaded file.

Command	Syntax	Response/Action	Remarks
Set	+FTPREST=<start position>	OK or: ERROR	Set the offset. OK or ERROR will be return.

Read	+ FTPREST?	+ FTPREST: < startposition > OK	Returns the size of the original set, no set return 0.
Test	+ FTPREST =?	 OK	Return OK only.

Example:

AT+FTPREST=3400000 // set the offset

OK

AT+ FTPREST?

+ FTPREST:3400000

OK

AT+FTPREST=?

OK

2.6.18 +FTPGET, Enter the File Download Mode

After connected FTP server successfully, FTPGET command will make a data connection and download file from the FTP server. The command mode will be kept until all data downloaded or send FTPCLOSE command. In the command mode, only FTPRECV and FTPCLOSE command will be responded. All other FTP commands will return ERROR.

The data received by the module will be store in the buffer and don't output from the serial port directly. User must read data by FTPRECV command.

Command	Syntax	Response/Action	Remarks
Set	+FTPGET=<filename>,<viewmode>	OK or: ERROR	OK – The command FTPRECV can be used to get data from buffer. ERROR – Get file error.
Read	+FTPGET?	+FTPGET:	Read the command mode state

		<filename>,<viewmode>,<eof> OK	
Test	+FTPGET =?	OK	Return OK only.

The following table shows the +FTPGET parameters.

<Parameter>	Description
<filename >	The name of the file to be downloaded
< viewmode >	Download mode： ：binary mode ：text mode
<eof>	0：File Downloading 1：All file data have been downloaded

Note: When execute FTPGET command, the cache data will be cleared. Make sure all cached data have been read out before next FTPGET command.

Example:

AT+FTPOPEN="xxx.xx.net","username","password"

OK

AT+FTPGET= "filename", 0 // 0 for binary mode

OK // Data has been received, G600 returns OK, the user can use the

// FTPRECV command to output data

AT+FTPGET= "filename", 0 //

ERROR // Connect the data fails, the return ERROR, exit the command mode.

AT+ FTPGET?

+ FTPGET： "filename",0,1 // File download has ended, the data stored in the cache

OK

AT+ FTPGET=?

OK

2.6.19 +FTPRECV, Read Data through the Serial Port

This command need to be used together with FTPGET command. It will read the data cached in the module through the serial port. It is different with the FTPRETR command and don't define the escape character. If the cached buffer is empty, the data length will be 0.

Note: The FTPRECV command can only be used in command mode (FTPGET command executes OK).

Command	Syntax	Response/Action	Remarks
Set	+FTPRECV=<req_LENGTH>	+FTPRECV: ret_LENGTH DATA OK or: ERROR:	The actual length will return firstly. Then the data output. OK
Read	AT+FTPRECV?	+ FTPRECV: <available> OK	Read length of the data stored in the buffer
Test	AT+FTPRECV=?	+ FTPRECV : (1-3000(LENGTH))	Return command format

The following table shows the +FTPRECV parameters.

<Parameter>	Description
< available >	Length of the data stored in the buffer
<req_LENGTH>	Request data length, maximum 3000 bytes
<ret_LENGTH>	The actual length of the readout data.

Example:

AT+FTPGET= AAA.txt", 0

OK

AT+ FTPRECV =2000 // 2000 bytes of data output through the serial port

+FTPRECV : 2000 // Module received command to return output data length, the carriage return line

DATA // the output data

OK // The end of the output data, the module returns OK

AT+ FTPRECV =2000 //

+FTPRECV : 1250 // Actually only 1250 bytes of buffer data

DATA //

OK //

AT+ FTPRECV =?

+ FTPRECV：（1-3000）

OK

AT+ FTPRECV?

+ FTPRECV： 5000 // There are 5000 bytes of buffer data can be read

OK

3 FAX

3.1.1 +FCLASS Select Mode

This command puts the MS into a particular mode of operation (Voice, data or FAX)

Command Type	Syntax
Execute	AT+FCLASS=<n> <n>: 0 (Data) 2 (FAX) 8 (Voice)

3.1.2 +FDT, Transmit Data

This action command prefixes data transmission. It requests the DCE to transmit a phase C page. It is issued at the beginning of each page in phase B or D.

Command Type	Syntax
Execute	AT+FDT

3.1.3 +FDR, Receive data

This action command initiates data reception.

Command Type	Syntax
Execute	AT+FDR

3.1.4 +FIP, Initialize Facsimile Parameters

This action command causes the DCE to initialize all Service Class Facsimile Parameters to the manufacturer determined default settings. It does not change the setting +FCLASS.

Command Type	Syntax
Set	AT+FIP[=<value>]

The following table shows +FIP parameters.

<Parameter>	Description
<value>	<value> indicates the profile; only one profile is possible for <value>=0

3.1.5 +FKS, +FK, Session Termination

This action command causes the DCE to terminate the session in an orderly manner. It will send a DCN message at the next opportunity and hang up.

Command Type	Syntax
Execute	AT+FKS or AT+FK

3.1.6 +FAA, Adaptive Answer

This command allows a adaptive answer of DCE depending on the parameter <value>.

Command Type	Syntax
Set	AT+FAA=<value>

The following table shows + FAA parameters.

<Parameter>	Description
<value>	<value> - 0: the DCE shall answer only as a Class 2 facsimile device - 1: the DCE can answer and automatically determine whether to answer as a facsimile DCE or as a data modem. If a data modem is detected, the DCE shall operate as described in T.32 8.3.2.4.

3.1.7 +FAP, Address & Polling Capabilities

This command indicates the remote station the address and polling capabilities and also controls the reporting of those frames if received.

Command Type	Syntax
Set	AT+ FAP=<sub>,<sep> ,<pwd>

The following table shows + FAP parameters.

<Parameter>	Description
<sub>	<sub>,subaddressing; default value: 0
<sep>	<sep>,selective polling; default value: 0
<pwd>	<pwd>,password; default value: 0

3.1.8 +FBS, Buffer Size

This command allows the DCE to report the size of its data buffers.

Command Type	Syntax	Response
Read	AT+FBS?	+FBS: <tbs>,<rbs>

The following table shows + FBS parameters.

<Parameter>	Description
<tbs>	<tbs>: transmit buffer size
<rbs>	<rbs> receive buffer size

3.1.9 +FBO, Data Bit Order

This set command controls the mapping between PSTN facsimile data and the DTE-DCE link. There are two choices:

- Direct: the first bit transferred of each octet on the DTE-DCE link is the first bit transferred on the GSTN data carrier.
- Reversed: the last bit transferred of each octet on the DTE-DCE link is the first bit transferred on the GSTN data carrier.

Command Type	Syntax
Set	AT+ FBO=<value>

The following table shows + FBO parameters.

<Parameter>	Description
<value>	<value> has the range: 0-3.

3.1.10 +FBU, HDLC Frame Reporting

This command enables/disables the DCE to report the contents of phase B and phase D HDLC frames to the DTE, as they are sent and received, in addition to other responses.

Command Type	Syntax
Set	AT+ FBU=<value>

The following table shows + FBU parameters.

<Parameter>	Description
<value>	<value> is in range 0-1.

3.1.11 +FCC, DS Capabilities Parameters

This command allows the DTE to sense and constrain the capabilities of the facsimile DCE, from the choices defined in table 2/T.30. When +FCC is modified by the DTE, the DCE shall copy +FCC into +FIS.

Command Type	Syntax
Set	AT+FCC=<vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp>(or T+DCC=..)

The following table shows + FCC parameters.

<Parameter>	Description
<vr>	<vr> resolution in range 0-1.
 	 bit rate in range 0-3.
<wd>	<wd> page width in pixels; only 0 value
<ln>	<ln> page length in range 0-2
<df>	<df> data compression format; only 0 value
<ec>	<ec> error correction; only 0 value
<bf>	<bf> file transfer; only 0 value
<st>	<st> scan time/line in range 0-7
<jp>	<jp> JPEG for color and B&W; only 0 value

3.1.12 +FCQ, Copy Quality Checking

This command allows controlling copy quality checking and correction by a facsimile DCE.

Command Type	Syntax
Set	AT+FCQ=<rq>,<tq>

The following table shows + FCQ parameters.

<Parameter>	Description
<rq>	<rq> controls copy quality checking and correction of data received from the remote station and delivered to DTE.
<tq>	<tq> controls copy quality checking and correction of image data received from the DTE and sent to the remote station.

3.1.13 +FCR, Capability to Receive Data

This command sets the capability to receive message data.

Command Type	Syntax
Set	AT+ FCR =<value>

The following table shows + FCR parameters.

<Parameter>	Description
<value>	<value> only value 1 allowed; it means that the DCE can receive message data. Bit 10 in the DIS or DTC frame will be set.

3.1.14 +FCS, Current Session Results

This command allows displaying the current session results, either as response to the read syntax or spontaneously during execution of +FDR.

Command Type	Syntax	Response
Read	AT+FCS?	+FCS: <vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp>

The following table shows + FCS parameters.

<Parameter>	Description
<vr>	<vr> resolution in range 0-1.
 	 bit rate in range 0-3.
<wd>	<wd> page width in pixels; only 0 value
<ln>	<ln> page length in range 0-2
<df>	<df> data compression format; only 0 value
<ec>	<ec> error correction; only 0 value
<bf>	<bf> file transfer; only 0 value
<st>	<st> scan time/line in range 0-7
<jp>	<jp> JPEG for color and B&W; only 0 value

3.1.15 +FCT, DTE Phase C Response Timeout

This command determines how long the DCE will wait for a command after having transmitted all available phase C data.

Command Type	Syntax
Set	AT+ FCT =<value>

The following table shows + FCT parameters.

<Parameter>	Description
<value>	<value> is in range 0-FFH, meaning 1 second units. Default value: 1EH (30) sec.

3.1.16 +FEA, Phase C Received EOL Alignment

This command enables optional octet-alignment of EOL markers in received T.4 data stream. It does not apply to T.6 data, or to any form of data.

Command Type	Syntax
Set	AT+ FEA =<value>

The following table shows + FEA parameters.

<Parameter>	Description
<value>	<value> may be: - 0: determines that T.4 EOL patterns are bit aligned (as received) - 1: determines that the last received bits of T.4 EOL patterns are octet aligned by the DCE, with necessary zero fill bits inserted.

3.1.17 +FFC, Format Conversion

This command determines the DCE response to mismatches between the phase C data delivered after the +FDT command and the data format parameters negotiated for the facsimile session.

Command Type	Syntax
Set	AT+FFC=<vrc>,<dfv>,<lnc>,<wdc>

The following table shows + FFC parameters.

<Parameter>	Description
<vrc>	<vrc> vertical resolution format codes may be: - 0: ignored enabled enabled for 1-D data. enabled for 2-D data.
<dfc>	<dfc> data format codes may be: - 0: ignored checking enabled conversion
<lnc>	<lnc> page length format codes may be: - 0: ignored checking enabled conversion for 1-D data

	conversion enabled for 2-D data
<wdc>	<wdc> page with format codes may be: - 0: ignored checking enabled conversion enabled

3.1.18 +FHS, Call Termination Status

This command indicates the cause of a hang-up +FHS is set by the DS at the conclusion of a FAX session. The DCE resets this value to 0 at the beginning of phase A.

Command Type	Syntax	Response
Read	AT+FHS?	+FHS: <value>

The following table shows + FHS parameters.

<Parameter>	Description
<value>	<value> may be in range 0-FFH

3.1.19 +FIE, Procedure Interrupt Enable

This command allows either station to initiate interrupts; the other station may ignore or accept the requests.

Command Type	Syntax
Set	AT+FIE=<value>

The following table shows + FIE parameters.

<Parameter>	Description
<value>	<value> only value 0 is allowed; it means that the procedure interrupt requests from the remote station are ignored and not reported to DTE.

3.1.20 +FIS, Current Session Parameters

This command allows the DTE to sense and constrain the capabilities used for the current session.

Command Type	Syntax
Set	AT+FIS=<vr>, ,<wd>,<ln>,<df>,<ec>,<bf>,<st>,<jp>

The following table shows + FIE parameters.

<Parameter>	Description
<vr>	<vr> resolution in range 0-1.
 	 bit rate in range 0-3.
<wd>	<wd> page width in pixels; only 0 value
<ln>	<ln> page length in range 0-2
<df>	<df> data compression format; only 0 value
<ec>	<ec> error correction; only 0 value
<bf>	<bf> file transfer; only 0 value
<st>	<st> scan time/line in range 0-7
<jp>	<jp> JPEG for color and B&W; only 0 value

3.1.21 +FIT, Inactivity Timeout

This command allows providing an inactivity timer which allows the DS to break away from an unsuccessful connection attempt at any stage of a facsimile transfer.

Command Type	Syntax
Set	AT+FIT=[<time>[,<action>]]

The following table shows + FIT parameters.

<Parameter>	Description
<time>	<time> valid time in range 0-255
<action>	<action> only value 0 possible and means: upon timeout the DCE shall go on-hook, executing an implied ATH command, then reset to +FCLASS=0.

3.1.22 +FLI, Local ID String

This command determines that DCE sends the ID frame if +FLI is not a zero-string.

Command Type	Syntax
Set	AT+FLI=<local ID string>

The following table shows + FLI parameters.

<Parameter>	Description
< local ID string >	<local ID string> 20 digit string; valid values are 0x20…0x7E.

3.1.23 +FLO, Set Flow Control

This command allows setting the flow control for communication via V.24 interface.

Command Type	Syntax
Set	AT+FLO=<value>

The following table shows + FLO parameters.

<Parameter>	Description
<value>	<value> indicates the kind of flow control: - 0: DTE-DCE flow control is disabled DTE-DCE flow control is DC1/DC3 (SW) DTE-DCE flow control is RTC/CTS (HW)

3.1.24 +FLP, Indicate Document to Poll

This command indicates document to poll. By default DTE has no document to poll.

Command Type	Syntax
Set	AT+FLP=[<value>]

The following table shows + FLP parameters.

<Parameter>	Description
<value>	<value> only value 0 is allowed.

3.1.25 +FMI, Request Manufacturer Identification

This command gives the manufacturer identification.

Command Type	Syntax	Response
Execute	AT+FMI Note: Get manufacturer identification	<manufacturer> OK or CME ERROR: <error>
Test	AT+FMI=?	OK

3.1.26 +FMM, Request Model Identification

This command gives the model identification.

Command Type	Syntax	Response
Execute	AT+FMM Note: Get model identification	< model > OK or CME ERROR: <error>
Test	AT+FMM=?	OK

3.1.27 +FMR, Request Revision Identification

This command gives the revised version of the mobile station.

Command Type	Syntax	Response
Execute	AT+FMR Note: get revision version	< revision > OK or CME ERROR: <error>
Test	AT+FMR=?	OK

3.1.28 +FMS, Minimum Phase C Speed

This command limits the lowest negotiable speed for a session.

Command Type	Syntax
Set	AT+FMS=[<value>]

The following table shows + FMS parameters.

<Parameter>	Description
<value>	<value> may be in range 0-3 (2400 bps to 9600 bps)

3.1.29 +FNR, Negotiation Reporting

This command controls the reporting of messages generated during T.30 phase B negotiations.

Command Type	Syntax
Set	AT+FNR=[<rpr>[,<tpr>[,<idr>[,<nsr>]]]]

The following table shows + FNR parameters.

<Parameter>	Description
<vpr>	<rpr> receiver parameters reporting 0-1 (no-yes)
<tpr>	<tpr> transmitter parameters reporting 0-1
<idr>	<idr> ID strings reporting 0-1 (no-yes)
<nsr>	<nsr> non-standard frames reporting 0-1 (no-yes)

3.1.30 +FNS Non-standard Frame FIF Octet String

This command allows sending the corresponding non-standard facilities frame.

Command Type	Syntax
Set	AT+FNS=<sring of hexadecimal coded octets>

Note: Valid is only the null string.

3.1.31 +FND, NSF Message Data Indication

Command Type	Syntax
Set	AT+FND=[<value>]

The following table shows + FND parameters.

<Parameter>	Description
<value>	<value> may be in range 0-1

3.1.32 +FPA Selective Polling Address

This command sets the selective polling address. The DCE sends the numeric string contained in the +FPA at the times specified in T.30, if the corresponding parameter is not zero string.

Command Type	Syntax
Set	AT+FPA=<selective polling address string>

The following table shows + FPA parameters.

<Parameter>	Description
<selective polling address string>	<selective polling address string> 20 digit string; valid values 0-9, *, #, space

3.1.33 +FPI Local Polling ID String

This command allows the DCE to send the ID frame if +FPI is not a zero string. Polling is not supported.

Command Type	Syntax
Set	AT+FLI=<local polling ID string>

The following table shows + FPI parameters.

<Parameter>	Description
<local polling ID string>	<local polling ID string> only zero string; polling is not supported.

3.1.34 +FPP, Packet Protocol Control

This command allows controlling the packet protocol. The packet protocol is not supported.

Command Type	Syntax
Set	AT+FPP=[<value>]

The following table shows + FPP parameters.

<Parameter>	Description
<value>	<value> only value 0 allowed.

3.1.35 +FPS, Page Status

This parameter contains a value representing the post age response, including copy quality and related end-of-page status

Command Type	Syntax
Set	AT+FPS=[<value>]

The following table shows + FPS parameters.

<Parameter>	Description
<value>	<value> may be: MCF, page good RTN, page bad; retrain requested RTP, page good; retrain requested PIN, page bad; interrupt requested PIP, page good; interrupt requested

3.1.36 +FPW Password Parameter

This parameter sets the password. The DCE sends the numeric string contained in +FPW at the times specified in T.30, if the corresponding parameter is not zero string.

Command Type	Syntax
Set	AT+FPW=<password string>

The following table shows + FPW parameters.

<Parameter>	Description
<password string>	<password string>: valid values: 0-9, *, #, space

3.1.37 +FRQ, Receive Quality Thresholds

This command allows making the "Copy Quality OK" decision using the command parameter. The command has no effect.

Command Type	Syntax
Set	AT+FRQ=<pgl>,<cbl>

The following table shows + FRQ parameters.

<Parameter>	Description
<pgl>	<pgl> in range 0-64H
<cbl>	<cbl> in range 0-FFH

3.1.38 +FRY Error Correction Mode Retry Count

Command Type	Syntax
Set	AT+FRY=[<value>]

The following table shows + FRY parameters.

<Parameter>	Description
<value>	<value> in range 0-FFH

3.1.39 +FSA, SubAddress Parameter

This command sets the Subaddress. The DCE sends the numeric string contained in +FSA at the times specified in T.30, if the corresponding parameter is not zero string.

Command Type	Syntax
Set	AT+FSA=<destination SubAddress string>

The following table shows + FSA parameters.

<Parameter>	Description
<destination SubAddress string>	<destination SubAddress string> 20 digit string; allowed values: 0-9, *, #, space

3.1.40 +FSP, Request to Poll

This command indicates whether or not the DTE wants to poll. The command has no effect.

Command Type	Syntax
Set	AT+FSP=[<value>]

The following table shows + FSP parameters.

<Parameter>	Description
<value>	<value> 0

4 STK Related Functionalities

This chapter mainly introduces the commands used for STK related functionalities development by G600 module. STK is short for SIM Application Toolkit. SIM manufacturer (usually is mobile network operator) implements the customized functions in SIM card according to user's request. Those functions are value-added services like custom news, weather forecast and stock market information. The basic functions like SMS, phone call are also included. This document provides the command interacted with SIM card. It will show users the functionalities menu of SIM card, how to select the menu and input the content. SIM card will interact with mobile station (MS) in two types: Proactive Command, start from SIM card, and Event Download, start from MS. These two types of communication compose STK multiple functionalities.

4.1 STK Command

The commands within this document related to STK must be activated by using the command of AT+CFUN=6 before the operation.

4.1.1 +STKPRO

This command is used to list the supported initiative commands so it supports Test command only. And the unsolicited result code +STKPRO:<proactive_cmd> is always used.

Command	Syntax	Response/Action	Remarks
Test	AT+ STKPRO=?	+STKPRO=01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,53 OK	All supported initiative commands.

Unsolicited result code:

+STKPRO:01,<type>

+STKPRO:05,<event list>

+STKPRO:16,<number>,<subaddr>,<type>,<alpha_1>,<icon_id1>,<alpha_2>,<icon_id2>

+STKPRO:17,<ss_data>,<alpha>,<icon_id>,<ref_number>

+STKPRO:18,<dcs>,<hex_string>,<alpha>,<icon_id>,<ref_number>

+STKPRO:19,<alpha>,<icon_id>,<ref_number>

+STKPRO:20,<alpha>,<icon_id>,<dtmf_string>

+STKPRO:21,<URL>,<alpha>,<icon_id>

+STKPRO:32,<tone>,<unit>,<interval>,<alpha>,<icon_id>

+STKPRO:33,<type>,<dcs>,<hex_string>,<icon_id>,<imm_resp>

+STKPRO:34, <type>,<dcs>,<hex_string>,<icon_id>

+STKPRO:35, <type>,<dcs>,<hex_string>,<max rsp len>,<min rsp len>,<default text>,<icon_id>

+STKPRO:36,<type>,<alpha>,<item_id>,<total_items>,<item_text>,<next_action>,<default_item>,<icon_id>,<icon_id_list_element>

+STKPRO:37,<type>,<alpha>,<item_id>,<total_items>,<item_text>,<next_action>,<icon_id>,<icon_id_list_element>

+STKPRO:38,<type>

+STKPRO:52,<dcs>,<hex string>,<icon_id>

+STKPRO:53,<language>

The unsolicited result codes and initiative commands are one-to-one corresponding. It should deal with the unsolicited result code with corresponding initiative command and related parameter, and feed back with AT+STKTR commands. For example, below unsolicited result code is received:

+STKPRO:36,<type>,<alpha>,<item_id>,<total_items>,<item_text>,<next_action>,<default_item>,<icon_id>,<icon_id_list_element>。

Initiative command 36 indicates selecting sub-menu and other parameter indicates related information like item ID, total items, item name, etc. It can display sub-menu if needed. And feed back with AT+STKTR commands to return to previous menu or select one of the sub-menus. Details as below:

<alpha>,<alpha_1>,<alpha_2>,<item_text>,<default text>,<dtmf_string>

:text string

<dcs> data coding scheme

<default_item > defaultitem (s.item_id)

<event list> may be:

- 04 : User activity event

- 05 : Idle screen available event

- 07 : Language selection

- 08 : Br0WSer Terminstion event

<format_mode>,<format_model>,<format_mode2> formatting mode value(alignment,font size, style)coded as following:Bit7 Bit6 Bits Bit4 Bit3 BitZ Bitl Bit0

- a lignment (Bitl Bit0):

- O : left

- 1 : center

- 2 : right

- 3 : language dependent(default)

- font size(Bit3 Bit2):

- 0 : normal

- 1 : large

- 2 : small

- 3 : reserved

- Style bold(Bit4):

- 0 : bold off

- 1 : bold on

- style italic(Bit5):

- O : italic off

- 1 : italic on

- Style underlined(Bit6):

- 0 : underlined off

- 1 : underlined on

- style strikethrough(Bit7):

- 0 : strikethrough off

- 1 : strikethrough on

<exists>,<exists1>,<exists2>

- 0 : text format is deactivated

- 1 : text format is activated

<hex_string>sting containing data in hexadecimal format

<icon_id >,<icon_id1>,<icon_id2>

<icon_id_list_element> icon identifier list object(list containing icon id's.Example:

<icon_id1>,<icon_id2>)

<interval>time duration in number of units

<item_id>item identifier(Identifier of item chosen s.GSM11.14)

<items>,<items1>,<items2>number of items in text formatting

<language>2bytes string indicating the language

<length>,<lenghl>,<length2>text formatting length.Gives the number of formatted character or sets a default text formatting

< max rsp len>maximum response length

<min rsp len>minimum response length

<next_action>next action

<number>called party number

<proactive_cmd>may be:

- 01: refresh

- 05: set up event list

- 16: set up call

- 17: send SS

- 18: send USSD

- 19: send SMS

- 20: send DTMF

- 21: launch browser

- 32: play tone

- 33: display text

- 34: get inkey

- 35: get input

- 36: select item

- 37: set up menu

- 38: language setting

- 40: set up mode text

- 52: run at cmd info

- 53: language notification

<ref number>reference number

<subaddr>called party subaddr

<ss_data>data String

<start_pos>,<start_pos1>,<start_pos2>start position of the text formatting. Set to the number of characters after the formatting shall be applied from the beginning of the SM data.

<type>integer as command qualifier;possible value 4 meaning "language"

<text colour>may be:

- 00: black

- 01: dark grey

- 02: dark red

- 03: dark yellow

- 04: dark green

- 05: dark cyan

- 06: dark blue

- 07: dark magenta

- 08: grey

- 09: white

- 10: bright red
- 11: bright yellow
- 12: bright green
- 13: bright cyan
- 14: bright blue
- 15: bright magenta

< tone > tone may be:

- 01: dial tone
- 02: call subscriber busy
- 03: congestion
- 04: radio path acknowledge
- 05: radio path not available
- 06: error / special information
- 07: call waiting tone
- 08: ringing tone
- 10: general beep
- 11: positive acknowledgement tone
- 12: negative acknowledgement or error tone

<total items> total items

<unit> may be:

- 0: minutes
- 1: seconds
- 2: tenth of seconds

<URL> URL that shall be loaded

Field of some command describes:

1、DISPLAY TEST

+STKPRO:33,<type>,<dcs>,<hex_string>,<icon_id>,<imm_resp>

<type>:

bit 1: 0 = normal priority

1 = high priority

bits 2-7: = RFU

bit 8: 0 = clear message after a delay

1 = wait for user to clear message

<dcs>:

data coding scheme of <hex_string>.

<hex_string>:

Contains the text to be displayed.

<icon_id>:

Optional icon id.(see GSM11.14 6.5.4)

<imm_resp>:

immediate response , not use.

Response format:

+STKTR: 33,<result>,<add_result>

<result>:

See <<G600 AT Command Set User Manual (STK_ENG)-V1.0.0.do>> 1.1.2.

<add_result> :

Not used.

2、GET INPUT

+STKPRO:35, <type>,<dcs>,<hex_string>,<max rsp len>,<min rsp len>,<default text>,<icon_id>

<type>

bit 1: 0 = digits (0-9, *, #, and +) only

1 = alphabet set

bit 2: 0 = SMS default alphabet

1 = UCS2 alphabet

bit 3: 0 = ME may echo user input on the display

1 = user input shall not be revealed in any way (see note)

bit 4: 0 = user input to be in unpacked format

1 = user input to be in SMS packed format

bits 5 to 7: = RFU

bit 8: 0 = no help information available

1 = help information available

<dcs>:

data coding scheme of <hex_string>.

<hex_string>:

Contains the text to be displayed.

<max rsp len>:

Maximum response length.

<min rsp len>:

Minimum response length.

<default text>:

Default response text which the user can use for his input .

<icon_id>:

Optional icon id.(see GSM11.14 6.5.4)

Response format:

+STKTR: 35,<result>,<add_result>,0,<dcs>,<hex_string>

<result>:

See <<G600 AT Command Set User Manual (STK_ENG)-V1.0.0.do>> 1.1.2.

<add_result> :

Not used.

<dcs>:

data coding scheme of <hex_string>.

<hex_string>:

Hex string of input.

3、SELECT ITEM

+STKPRO:36,<type>,<alpha>,<item_id>,<total_items>,<item_text>,<next_action>,<default_item>,<icon_id>,<icon_id_list_element>

<type>:

bit 1-7:not used

bit 8: 0 = no help information available

1 = help information available

<alpha>

The alpha identifier included by the SIM shall be used by the ME as the title for the list of items.

<item_id>:

item identifier.

<total items>

total items.

<item_text>:

Item text.

<next_action>:

The Item Next action indicator gives the possible actions that will be initiated by the SIM in case of selection by the user.

<default_item>:

The SIM may supply with the list, if applicable, indication of the default item, e.g. the previously selected item.

<icon_id>

Optional icon id.(see GSM11.14 6.5.4)

<icon_id_list_element>:

See GSM11.14-12.32.

Response format:

+STKTR: 36,<result>,<add_result>,0,<dcs>,<hex_string>

<result>:

See <<G600 AT Command Set User Manual (STK_ENG)-V1.0.0.do>> 1.1.2.

<add_result> :

Not used.

<dcs>:

data coding scheme of <hex_string>.

<hex_string>:

Hex string of input item.

4、SET UP MENU

+STKPRO:37,<type>,<alpha>,<item_id>,<total_items>,<item_text>,<next_action>,<icon_id>,<icon_id_list_element>

<type>:

bit 1-7:not used

bit 8: 0 = no help information available

1 = help information available

<alpha>

The alpha identifier included by the SIM shall be used by the ME as the title for the list of items.

<item_id>:

item identifier.

<total items>

total items.

<item_text>:

Item text.

<next_action>:

The Item Next action indicator gives the possible actions that will be initiated by the SIM in case of selection by the user selected item.

<icon_id>

Optional icon id.(see GSM11.14 6.5.4)

<icon_id_list_element>:

See GSM11.14-12.32.

Response format:

+STKTR: 37,<result>,<add_result>

<result>:

See <<G600 AT Command Set User Manual (STK_ENG)-V1.0.0.do>> 1.1.2.

<add_result> :

Not used.

4.1.2 +STKTR

This command is used to response unsolicited result code +STKPRO. And the response of initiative command SIM-APPL-TK is shown by using unsolicited result code +STKPRO. Structured as below:

AT+STKTR=<proactive_cmd>[,type][,<result>,<add_result>[,<reference_number>][,<last_cmd>][,<dcs>][,<hex string>]]

Command	Syntax	Response/Action	Remarks
Set	AT+STKTR=1,0	OK Or CME ERROR:<error>	Illustrate with initiative command "1".
Test	AT+STKTR=?	+STKTR=01,05,16,17,18,19,20,21,32,33,34,35,36,37,38,40,53 OK	All supported initiative command.

It lists all parameters of this command above but for the parameter formats, please see below:

+STKPR: 01,<result>,[<add_result>]	refresh
+STKPR: 05,<result>	set up event list
+STKTR: 16,<result>,<add_result>	set up call
+STKTR: 17,<result>,<add_result>,<reference_number>	send SS
+STKTR: 18,<result>,<add_result>,<reference_number>	send USSD
+STKTR: 19,<result>,<add_result>,<reference_number>	send SMS
+STKTR: 20,<result>,<add_result>	send DTMF
+STKTR: 21:<result>	launch browser
+STKTR: 32,<result>,<add_result>	play tone
+STKTR: 33,<result>,<add_result>	display text
+STKTR: 34,<result>,<add_result>,0,<dcs>,<hex_string>	get inkey
+STKTR: 35,<result>,<add_result>,0,<dcs>,<hex_string>	get input
+STKTR: 36,<result>,<add_result>,0,<dcs>,<hex_string>	select item

Note: the 0 stands for the parameter <last_cmd>which is obsolete but not removed so far

+STKTR: 37,<result>,<add_result>	set up menu
+STKTR: 38,<type>,<language as integer,e.g.28261>	language setting
+STKTR: 40,<result>,<add_result>	set up idle mode text

Parameter meaning:

<add_result>: Additional result

<dcs>: Data encoding rules

<hex_string>: 16-band data string. It usually uses GSM format for phone number, such as 3132 for 12, and Unicode format for SMS, such as 00310032 for 12.

<last_cmd>: The last command and usually is 0.

<proactice_cmd>: Initiative command shown in decimal (refer to +STKPRO)

<reference_number>: Integer including the numbers returned to initiative command. It is used in SMS,SS, and USSD for inputting phone number or SMS content.

<result>: It is usually decimal and has different meaning with different value:

0: Succeed to command

1: Resolve part of the command

2: Command without information

3: Refresh by reading Efs

4: Succeed to command but display no icon

5: Succeed to command but it is improved by SIM calling control

6: Succeed to command but service limited

7: Command after improvement

16: Terminate SIM calling by user

17: Draw back in SIM calling by user

18: No response from user

19: Help for desired operation

20: Terminate USSD and SS transmission by user

32: ME cannot deal with command at the moment

33: It cannot deal with command because of network situation

34: Calling request is not accepted by user

35: Calling is ended by user before connecting or releasing network

36: Action is not matched to current time

37: Interaction with call control by SIM, temporary problem

38: Display gibberish when browsing

48: Command is over ME workload

49: Command type is not resolved correctly by ME

50: Command type is not resolved correctly by ME

51: Command type is not resolved correctly by ME

52: SS returns error

53: SMS RP-ERROR

54: Error. All requests should be ignored.

55: ussd returns error

56: Errors for class commands. Such as class "a" should be supported.

57: Interaction with call control by SIM or MO short message control by SIM, permanent problem.

58: Bear the unavoidable protocol errors (if class "e" is supported)

<type> command modification (only use when initiative command is 38)

4.1.3 +STKENV

This command can send package command of SIM-APPL-TK to MS which is used to select main menu and download events. Its format is:

AT+STKENV=<envelope_cmd>,<optional_ENV_data>

In detail:

AT+STKENV=214,7,<language>

AT+STKENV=214,8,<cause>

AT+STKENV=211,<item_id>,<help_request>

Command	Syntax	Response/Action	Remarks
Set	AT+STKENV=211,01	OK Or CME ERROR:<error>	Select the first item of main menus
Test	AT+STKENV=?	OK	

Parameter meaning:

<cause> usually indicates:

00: End by user

01: End by error

<envelope_cmd> support package command:

code 211: select menu (need <item identifer>)

code 214: download event (only one event can be included in item list)

<item id>: menu item id

<help requested>: help request or not

1: yes

0: no

<language>: language used in DTE

<optional_ENV_data>: command code related to indication and parameter

for code 211: item id

for code 214: event list

4.1.4 +STKPROF

This command is used to read and modify the configuration data of terminals. Such kind of data is sent by STK external customer. And he will also indicate related SIM services.

Command	Syntax	Response/Action	Remarks
Set	AT+STKPROF=<length>,<data>	OK Or	Receive data

		CME ERROR:<error>	
Read	AT+STKPROF?	+STKPROF:<length>,<data> e.g.+STKPROF=2,"1F7F" OK	
Test	AT+STKPROF=?	OK	

Parameter meaning:

<length>:integer type value;number of hex values that are sent to TE in <data>

Note:<length>set to 0 forces a reset to the default terminal profile stored in the ME.

<data>:terminal profile data coded in hex format.

Example:

AT+STKPROF=2,"1F7F"

OK

4.1.5 +STKCC

SIM-APPL-TK call control command.

The SIMAP call control status is displayed using the unsolicited result code.

+STKCC:<cc_command>,… defined as:

- +STKCC: 1,<res_val>,<alpha>,<number>
- +STKCC: 2,<res_val>,<alpha>,<ss_code>
- +STKCC: 3,<res_val>,<alpha>,<ussd_code>
- +STKCC: 4,<res_val>,<alpha>,<ton_npi>,<sc_addr>,<ton_npi>,<dest_addr>

Parameter meaning:

<cc_command> may be:

- 1: set up call
- 2: send SS
- 3: send USSD
- 4: send SM

<res_val> call control result value

<alpha> text string

<number> called party number

<ton_npi> type of number and numbering plan

<sc_addr> service centre address

<dest_addr> destination address

4.1.6 +STKCNF

SIM-APP-TK proactive session status +STKCNF, The SIMAP proactive session status is displayed using the unsolicited result code

+STKCNF: <proactive_cmd>,<result>,<add_result>,<sw1>

Parameter meaning:

<proactive_cmd> A decimal code which indicates the command that was finished. Proactive STK command values are documented in +STKPRO. Additionally following proactive commands can be indicated:

- 02: More Time

- 03: Poll Interval

- 04: Polling OFF

- 39: Time Management

<add_result> additional result code

<sw1> status of the last response may be:

- 0: command to SIM was suppressed because of multiple terminal response or wrong client

- other responses see GSM 11.11

4.1.7 +STKLBR

SIM-APPL-TK Launch Brower Command STKLBR. This command allows entering a response to a SIM-APPL-TK launch browser request. The SIMAP command Launch Browser is sent to the DTE using the unsolicited result code:

+STKLBR: <cmd_details>,<URL>,[<bearer>],[gateway],[Ref_1],…,[Ref_n]

The response to the unsolicited result is given with the command:

Command	Syntax	Response/Action	Remarks
Set	AT+STKLBR=<result>,<add_result>	OK Or CME ERROR:<error>	
Test	AT+STKLBR=?	OK	

Parameter meaning:

<cmd_details>

- 00 = launch browser, if not already launched;

- 02 = use the existing browser (the browser shall not use the active existing secured session) ;

- 03 = close the existing browser session and launch new browser session;

<URL> URL that shall be loaded

<bearer>

- '00' = SMS

- '01' = CSD

- '02' = USSD

- '03' = GPRS

<gateway> This text gives to the mobile the name/identity of the Gateway/Proxy to be used for connecting to the URL.

<Ref_1>, <Ref_n> Provisioning File Reference

<result> see command +STKTR

<add_result> see command +STKTR

Example:

AT+STKLBR=0,0

OK

4.2 Examples

The SIM card used in this example is belonged to Easyown which may have different services to other SIM card. To show the Chinese characters in menu, it needs set AT+CSCS="UCS2" first.

Use AT+CFUN=6 to activate STK functionalities.

AT+CFUN=6

OK

+STKPRO: 33,0,8,"8F7B677E75316211795E5DDE884CFF01",0,0 // Easyown

OK

It will receive the unsolicited result code +STKPRO after sending AT+CFUN=6 and return the initiative command 33. As previous section mentioned, 33 indicates texture and has the same format to +STKPRO:33,<type>,<dcs>,<hex_string>,<icon_id>,<imm_resp>, and shows "8F7B677E75316211795E5DDE884CFF01". User can decide to show or not as desired. It returns in the format of +STKTR: 33,<result>,<add_result>.

AT+STKTR=33,0,255 // <result>=0 indicates succeed to command

OK

+STKPRO: 37,0,"795E5DDE884C59295730",1,7,"8F7B677E95EE5019",0,0,0 // Greeting

+STKPRO: 37,0,"795E5DDE884C59295730",2,7,"77ED4FE17FA453D1",0,0,0 // Mass SMS

+STKPRO: 37,0,"795E5DDE884C59295730",3,7,"670065B063A88350",0,0,0 // Recommendation

+STKPRO: 37,0,"795E5DDE884C59295730",4,7,"4E1A52A17CBE9009",0,0,0 // Featured services

+STKPRO: 37,0,"795E5DDE884C59295730",5,7,"77ED4FE1670D52A15385",0,0,0 // SMS Agent service

+STKPRO: 37,0,"795E5DDE884C59295730",6,7,"8D224FE1901A",0,0,0 // Finance Info service

+STKPRO: 37,0,"795E5DDE884C59295730",7,7,"00530049004D53614FE1606F",0,0,0 // SIM Info

+STKPRO: OKAY

Return initiative command 33 and get 37 back to list main menu which including each menu ID: 1-7. Create menu and return:

AT+STKTR=37,0,255

OK

Take the Finance Info Service as example:

AT+STKENV=211,6,0

OK

+STKCNF: 129,0,255,145

+STKPRO: 36,0,"",1,4,"8D227BA15BB6",0,0,0 // Wealth Management

+STKPRO: 36,0,"",2,4,"884C60C5901A",0,0,0 // News of Stock Market

+STKPRO: 36,0,"",3,4,"91D1624B638C",0,0,0 // Stock Recommendation

+STKPRO: 36,0,"",4,4,"83DC53557BA16406",0,0,0 // Menu Management

+STKPRO: OKAY

Above shows the corresponding sub-menu whose id: 1-4. Select the "Wealth Management" with this command:

AT+STKTR=36,0,255,0,0,"01" // "01": The first item

OK

+STKCNF: 36,0,255,145

+STKPRO: 36,0,"",1,5,"5B9A5236",0,0,0 // Custom

+STKPRO: 36,0,"",2,5,"67E581EA900980A1884C60C5",0,0,0 //Check Optional Stock

+STKPRO: 36,0,"",3,5,"6DF852A081EA900980A1",0,0,0 // Add Optional Stock

+STKPRO: 36,0,"",4,5,"4E1A52A14ECB7ECD",0,0,0 // Business Instruction

+STKPRO: 36,0,"",5,5,"5E2E52A9548C8D448D39",0,0,0 // Help & Price

+STKPRO: OKEY

Select "Help & Price":

AT+STKTR=36,0,255,0,0,"05" // "05": The fifth item

OK

+STKCNF: 36,0,255,145

+STKPRO: 19,"77ED4FE153D190014E2D2026",0,1 //Sending SMS

+STKPRO: OKAY

+STKCNF: 36,0,255,145

+STKPRO: 36,0,"",1,5,"5B9A5236",0,0,0 // Custom

+STKPRO: 36,0,"",2,5,"67E581EA900980A1884C60C5",0,0,0 // Check Optional Stock

+STKPRO: 36,0,"",3,5,"6DF852A081EA900980A1",0,0,0 // Add Optional Stock

+STKPRO: 36,0,"",4,5,"4E1A52A14ECB7ECD",0,0,0 // Business Instruction

+STKPRO: 36,0,"",5,5,"5E2E52A9548C8D448D39",0,0,0 // Help & Price

+STKPRO: OKEY

+CMTI: "SM",22 // Receive an SMS about Help & Price

Now return to previous menu and do the mass SMS operation:

AT+STKTR=36,17 // <result>=17 indicates return to previous menu

OK

+STKCNF: 36,17,255,145

+STKPRO: 36,0,"",1,4,"8D227BA15BB6",0,0,0 // Wealth Management

+STKPRO: 36,0,"",2,4,"884C60C5901A",0,0,0 // News of Stock Market

+STKPRO: 36,0,"",3,4,"91D1624B638C",0,0,0 // Stock Recommendation

+STKPRO: 36,0,"",4,4,"83DC53557BA16406",0,0,0 // Menu Management

+STKPRO: OKAY

AT+STKTR=36,17 //<result>=17 indicates return to previous menu

OK

+STKCNF: 36,17,255,144

+STKPRO: Proactive End // Back to root directory

AT+STKNEV=211,2,0 // Select Mass SMS in Main Menu

OK

+STKCNF: 129,0,255,145

+STKPRO: 36,0,"",1,6,"65B07F1677ED4FE1",0,0,0 // New SMS

+STKPRO: 36,0,"",2,6,"5DF2653677ED4FE1",0,0,0 // SMS received

+STKPRO: 36,0,"",3,6,"7EC454587BA17406",0,0,0

+STKPRO: 36,0,"",4,6,"589E52A07FA47EC4",0,0,0

+STKPRO: 36,0,"",5,6,"7FA47EC46539540D",0,0,0

+STKPRO: 36,0,"",6,6,"522096647FA47EC4",0,0,0

+STKPRO: OKAY

AT+STKTR=36,0,255,0,0,"01" // "01": select the first sub-menu for new SMS

OK

+STKCNF: 36,0,255,144

+STKPRO: 35,3,8,"8F93516577ED4FE151855BB9",140,1,"",0 // Input SMS content

+STKPRO: OKAY

AT+STKTR=35,0,255,0,0,"003100320033"

OK

+STKCNF: 35,0,255,145

+STKPRO: 36,0,"",1,3,"900962E97FA47EC4",0,0,0 // Select Group

+STKPRO: 36,0,"",2,3,"900962E953F77801",0,0,0 // Select Number

+STKPRO: 36,0,"",3,3,"8F93516553F77801",0,0,0 // Input Number

+STKPRO: OKAY

AT+STKTR=36,0,255,0,0,"03" // "03": Select the third sub-menu to input number.

OK

+STKCNF: 36,0,255,145

+STKPRO: 35,0,8,"8F93516553F77801",20,1,"",0 // Input Number

+STKPRO: OKAY

AT+STKTR=35,0,255,0,0,"3130303836" // Phone Number: 10086

OK

+STKCNF: 35,0,255,145

+STKPRO: 36,0,"",1,3,"53D1900177ED4FE1",0,0,0 // Send SMS

+STKPRO: 36,0,"",2,3,"7EE77EED6DFB52A0",0,0,0

+STKPRO: 36,0,"",3,3,"67E5770B63A56536800552178868",0,0,0

+STKPRO: OKAY

AT+STKTR=36,0,255,0,0,"01" // Select to Send SMS

OK

+STKCNF: 36,0,255,145

+STKPRO: 19,"",0,2

+STKPRO: OKAY

+STKPRO: 33,129,8,"53D190015B8C6BD5FF01",0,0 // Finish Sending

+STKPRO: OKAY

The example above shows how to check the help & price of wealth management service and sending SMS. Since SIM card services are different to different brand, this example only introduces the method of checking menu and parameter meaning of commands.

5 MUX

5.1 Introduction

The multiplexer provides mechanisms for conveying streams of data between TE and MS over a single start-stop framed, serial link. The multiplexer provides a virtual connection between a process in the TE and a similar process in the MS. For example, a PC application supporting SMS functions could be connected to the SMS handler in the MS via a multiplexer channel. Each channel between TE and MS is called a Data Link Connection (DLC) and is established separately and sequentially.

The multiplexer has three operating options, basic, advanced without error recovery and advanced with error recovery (Please refer to GSM 07.10). G600/G610 only supported the Basic mode.

G600/G610 multiplexer provides the next services:

- Start up services
- DLC establishment services
- Data services
- DLC Release services
- Close down services

Note： G600/G610 GPRS module can support of largest 4 DLC at same time.

5.2 Frame Structure

All information transmitted between the TE and MS is conveyed in frames

5.2.1 Frame Structure of Basic Mode

The basic frame structure is then as follows:

Flag	Address	Control	Length Indicator	Information	FCS	Flag
1 octet	1 octet	1 octet	1 or 2 octets	Unspecified length but integral number of octets	1 octet	1 octet

5.2.2 Flag

0xF9 for basic mode, 0x7E for advance mode. G600/G610 only support the Basic mode

5.2.3 Address Field

The address field consists of a single octet. It contains the Data Link Connection Identifier (DLCI), the C/R bit and the address field extension bit.

1	2	3	4	5	6	7	8

EA	C/R	DLCI

EA: use for extend the address. EA bit is always set to 1

C/R: command/response, see below.

Command/response	Direction			C/R value
Command	Initiator	-----→	Responder	1
	Responder	-----→	Initiator	0
Response	Initiator	-----→	Responder	0
	Responder	-----→	Initiator	1

DLCI： DLC ID (Data Link Connection Identifier), range from 0~63.

The DLCI is used to identify an individual user information stream as well as to identify connections between TE and MS.

5.2.4 Control Field

The content of the control field defines the type of frame.

FrameType	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8
SABM	1	1	1	1	P/F	1	0	0
UA	1	1	0	0	P/F	1	1	0
DM	1	1	1	1	P/F	0	0	0
DISC	1	1	0	0	P/F	0	1	0
UIH	1	1	1	1	P/F	1	1	1
UI	1	1	0	0	P/F	0	0	0

P/F: Poll/Final bit

The poll/final (P/F) bit shall serve a function in both command frames and response frames. (In command frames, the P/F bit is referred to as the P bit. In response frames, it is referred to as the F bit.)

The poll (P) bit set to 1 shall be used by a station to solicit (poll) a response or sequence of responses from the other station.

The final (F) bit set to 1 shall be used by a station to indicate the response frame transmitted as the result of a soliciting (poll) command.

Before a station issues another frame with the P bit set to 1, it shall have received a response frame from the other station with the F bit set to 1. If no valid response frame is obtained within a system-defined time-out period, the retransmission of a command with the P bit set to 1 for error recovery purposes shall be permitted.

SABM (Set Asynchronous Balanced Mode): The SABM command shall be used to place the addressed station in the Asynchronous Balanced Mode (ABM) where all control fields shall be one octet in length. The station shall confirm acceptance of the SABM command by transmission of a UA response at the first opportunity. Upon acceptance of this command, the DLC send and receive state variables shall be set to zero.

If the responding station is not ready or unwilling to establish the particular DLC it will reply with a DM frame with the F-bit set to 1. If no UA or DM response has been received after T1 the initiating station may retransmit the SABM. This action may be repeated until a response is obtained or action is taken by a higher layer.

UA (Unnumbered Acknowledgement): The UA response shall be used by the station to acknowledge the receipt and acceptance of SABM and DISC commands.

DM (Disconnected Mode): The DM response shall be used to report a status where the station is logically disconnected from the data link. When in disconnected mode no commands are accepted until the disconnected mode is terminated by the receipt of a SABM command. If a DISC command is received while in disconnected mode a DM response should be sent.

DISC (Disconnect): The DISC command shall be used to terminate an operational or initialization mode previously set by a command. It shall be used to inform one station that the other station is suspending operation and that the station should assume a logically disconnected mode. Prior to do the command, the receiving station shall confirm the acceptance of the DISC command by the transmission of a UA response.

5.2.5 Length Indicator

BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8
EA	L1	L2	L3	L4	L5	L6	L7

EA: use for extend the address

When the EA bit is set to 1 in an octet, it is signifies that this octet is the last octet of the length field.

5.2.6 Information Field

The information field is the payload of the frame and carries the user data and any convergence layer information. The field is octet structured. The information field is only present in I frames, UI frames and UIH frames.

5.2.7 Frame Checking Sequence Field (FCS)

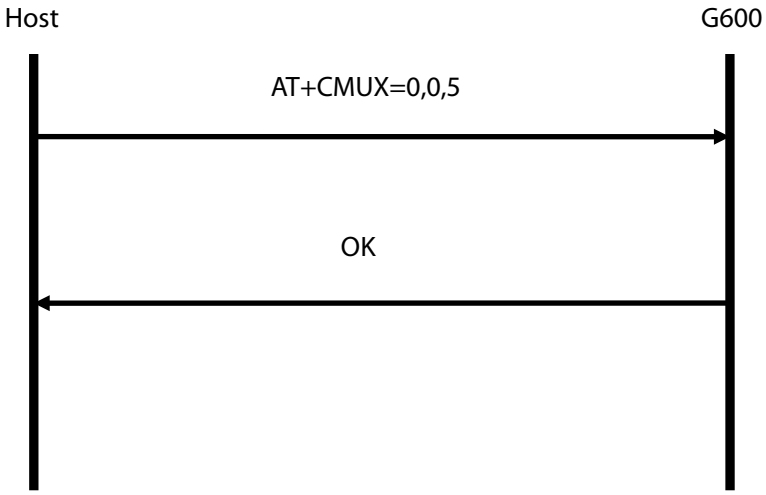
The FCS field has only one octet, the generator polynomial is: x8+x2+x+1.

For the UIH frame, the FCS shall be calculated over only the address and control fields.

For the command/response frame, the FCS shall be calculated include the address, control and length fields.

5.3 Sample

5.3.1 Start up Services



Use AT command: AT+CMUX to active multiplexer. The syntax is:

AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]

Parameter:

Mode: the mode of multiplexer, G600/G610 must be set to 0

0-Basic mode

1-Advance mode

Subset: type of frame, 0 for G600/G610

0-UIH frames used only

1-UI frames used only

2-I frames used only

Port_speed:

1-9600 bit/s

2-19200 bit/s

3-38400 bit/s

4-57600 bit/s

5-115200 bit/s

6- 230400 bit/s

N1: Maximum Frame Size

1~32768, default is 31, suggest less than 127

T1: Acknowledgement Timer, unit 10ms.

1~255, default value is 10 (100ms)

N2: Maximum number of retransmissions

0~100, default 3

T2: Response timer for the multiplexer control channel, unit 10ms

2~255, default value is 30 (300ms)

T3: Wake up response timer, unit s

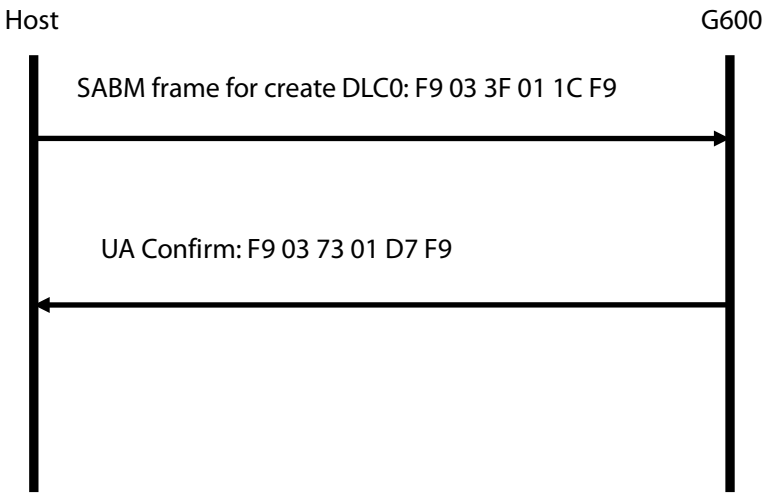
1~255, default value 10

K: reserved

5.3.2 Establishment Services

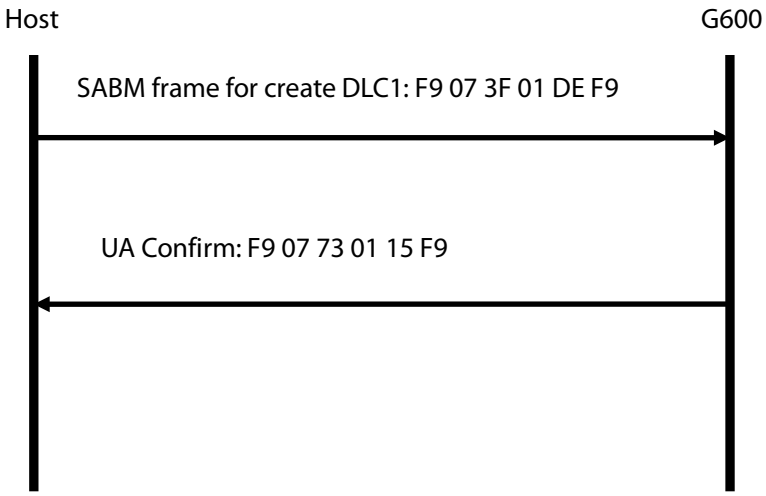
5.3.2.1 Establishment the control channel

The control channel (DLC0) must be establishment firstly after active the multiplexer by AT+CMUX.

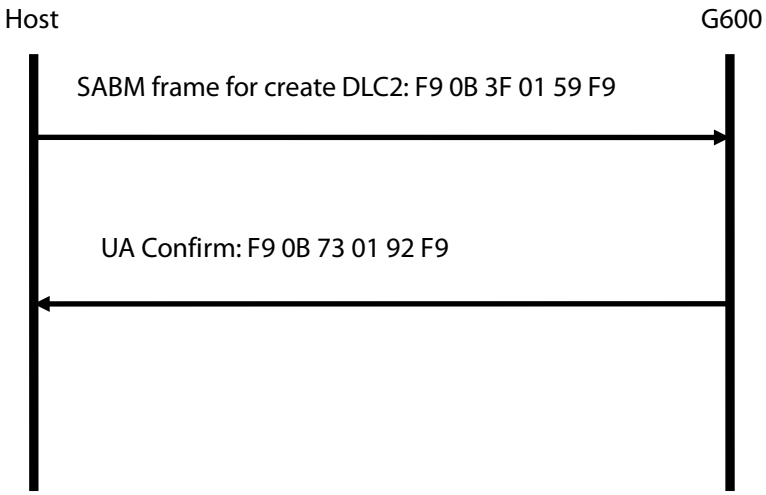


5.3.2.2 Establishment Data Channel

Establishment DLC1:



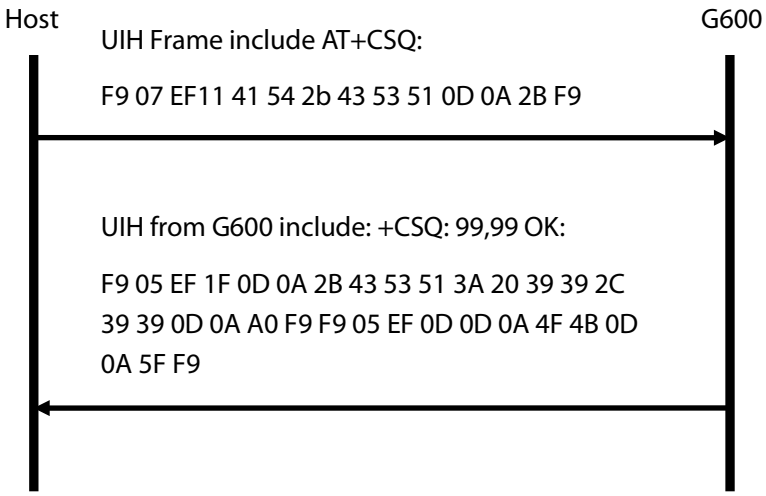
Establishment DLC2:



5.3.3 Data Services

After established the DLCx, We can send data to G600/G610 by UIH frame.

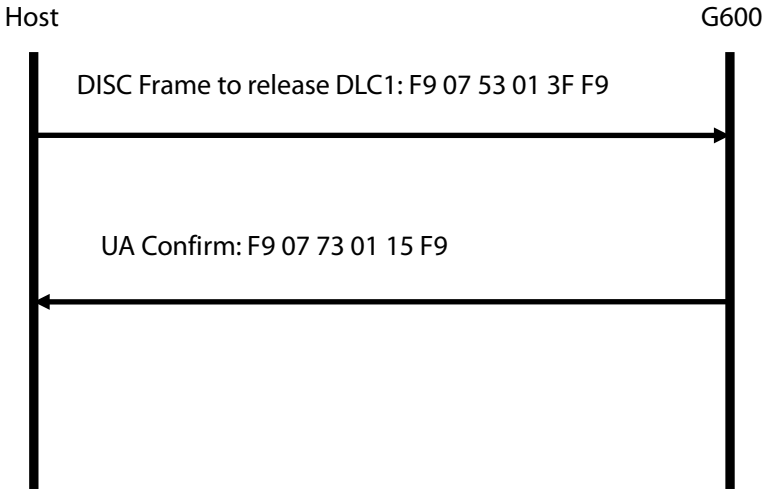
For example, send AT+CSQ from DLC1 (other DLC is similar). The frame data between host and G600 like this:


Host
G600
UIH Frame include AT+CSQ:
F9 07 EF11 41 54 2b 43 53 51 0D 0A 2B F9
UIH from G600 include: +CSQ: 99,99 OK:
F9 05 EF 1F 0D 0A 2B 43 53 51 3A 20 39 39 2C
39 39 0D 0A A0 F9 F9 05 EF 0D 0D 0A 4F 4B 0D
0A 5F F9

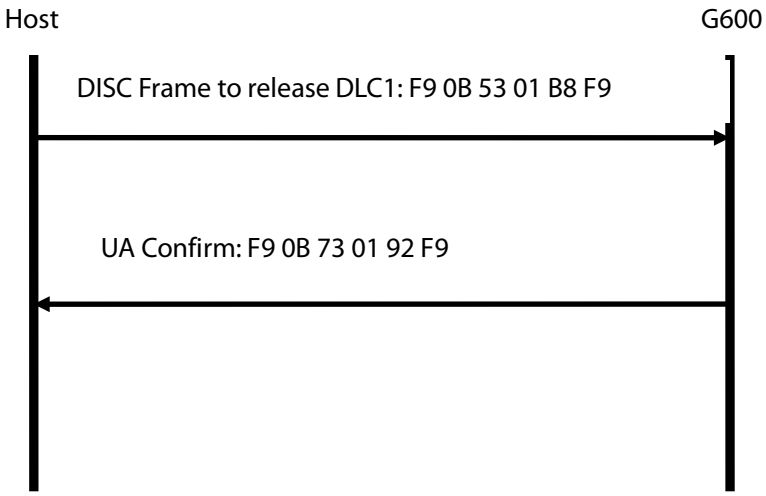
5.3.4 DLC Release Services

5.3.4.1 Release Data Channel

Release DLC1:

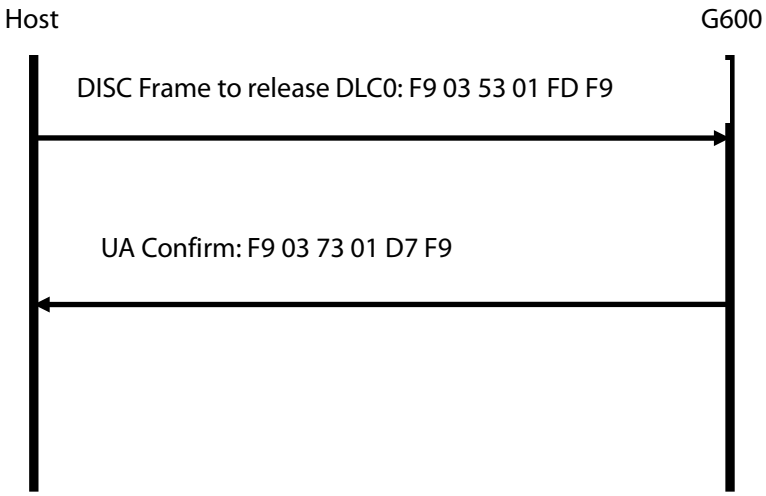


Release DLC2:



5.3.4.2 Release Control Channel

Release DLC0. After release the DLC0, G600/G610 will close the multiplexer service and back to AT command mode.



5.4 Reference DOC

07. 10_ts. pdf

6 Additional Command

6.1.1 +VTA

This command enable/disable play DTMF tone at local side when send DTMF to the network by VTS.

Command	Syntax	Response/Action	Remarks
Set	+VTA=<para>	OK or: ERROR	Enable/Disable plays DTMF at local side.
Read	+VTA?	+VTA: <para> OK or: ERROR	Query status
Test	+VTA=?	+VTA: <para> OK or: ERROR	Query the range of parameters.

The following table shows the +VTA parameters.

<Parameter>	Description
<para>	0：Disable play DTMF tone at local side 1：Enable play DTMF tone at local side (Default value)

Example:

AT+VTA?

+VTA: 1

OK

AT+VTA=?

+VTA: (0,1)

OK

6.1.2 PPP Configuration

For any special PPP client, G600 must do any special work to compatible with them.

Note: This command must be used base on GHT suggestion according to customer problem.

Command	Syntax	Response/Action	Remarks
Set	+GTSET=<pname>,<value>	OK or: ERROR	Make any special setting.

The following table shows the +GTSET parameters.

<Parameter>	Description
<pname>	"PPPAUTH": negotiate the authentication mode when LCP process.
<value>	Range from 0 to 3, default is 0 0: do not negotiate the authentication mode 1: PAP 2: CHAP 3: PAP & CHAP
<future>	"PPPMODE": set any special parameter when perform PPP.
<value>	Range: 0-255, default is 0. Every bit represents a parameter. 0: Normal 1: PPP client is porting from LWIP 2: IPCP Frame Error 4: PPP client cannot support Magic-Number 8: PPP client do not negotiate IP when IPCP

7 Error Code

7.1 New TCP/IP Stack Error Code

Parameter	Description
<Err>	1, "TCPIP Param wrong " 2, "TCPIP Internal ERROR " 3, "TCPIP IP/PORT Reused " 4, "TCPIP Memory Used up " 5, "TCPIP Operation Not Supported " 6, "TCPIP Connect Failed " 7, "TCPIP Connect Refsed " 8, "TCPIP Connect Timeout " 9, "TCPIP Connection Exist " 10, "TCPIP Host Not Found " 11, "TCPIP DNS Failed, Retry Later " 12, "TCPIP DNS ERROR " 13, "TCPIP DNS Got An Invalid IP " 14, "TCPIP Connection Doesn't Exist " 15, "TCPIP Data Too Long " 16, "TCPIP Connection Reset " 17, "TCPIP Connection Error " 18, "TCPIP Buffer Full " 19, "TCPIP Bad Network " 20, "TCPIP PDP Not Active " 21, "TCPIP GPRS Not Attach " 22, "TCPIP Another Operation going " 23, "TCPIP PDP Active " 24, "TCPIP Not Support In Multi Mode " 25, "TCPIP Not Support In Single Mode " 26, "TCPIP Index Invalid " 27, "TCPIP Del Mode Invalid " 28, "TCPIP This Command Is Forbidden Now "

	29, "TCPIP TX Window Full " 30, "TCPIP In Audio Call, Retry Later " 31, "TCPIP Unknown "

7.2 FTP Error Code

Parameter	Description
<Err>	100, "unknown" 4, "operation not supported" 25, "Invalid characters in text string" 34, "numeric parameter instead of text parameter" 36, "numeric parameter out of bounds" 301, "PDP Inactive" 302, "FTP session is active" 303, "FTP session is inactive" 304, "FTP command in progress" 305, "MIPODM mode in progress"

7.3 MMS Error Code

Parameter	Description
<Err>	3000, " ok " 3001, " no network" 3002, " PDP is activated" 3003, " PDP active fail" 3004, " socket create fail" 3005, " socket connect fail" 3006, " WSP create fail" 3007, " WSP connect fail" 3008, " WTP create fail" 3009, " header pack fail" 3010, " PDU pack fail" 3011, " PDU unpack fail "

	3012, " data receive fail" 3013, " receive result error" 3014, " PDP is break" 3015, " param error" 3016, " no content" 3017, " malloc error" 3018, " http bad request" 3019, " other error"

8 AT Command Instruction of Cell Lock

The functions below are only supported by V0B.03.16 (G600) or above.

8.1 +GTBCCH

BCCH Channel Lock

Note: If one of the channels is locked, BCCH channel will not be able to lock.

Command	Syntax	Response/Action	Remarks
Set	AT+GTBCCH=<mode>[,<bcch>]	+BCCH: LOCK SUCCESS OK or +BCCH: LOCKED OK or +BCCH: UNLOCK SUCCESS or +BCCH UNLOCKED or +BCCH:<bcch1>,…<bcchn> +BA(num):<BA list> OK or ERROR	Mode 1 & 2 has the same meaning. It locks the corresponding BCCH cell channel if <bcch> is NULL. It locks the desired BCCH channel as <bcch> set. Mode=0: unlock; Mode=32: list the 7 BCCH channels with strongest signal and BA-list maximum in 32. 1. Module must be unlocked before channel lock. 2. Channels in +BCCH list are priority when locking channel.
Read	AT+GTBCCH?	+BCCH: <bcch>,<mcc>,<mnc>,<lac>,<cell-id> OK or	If a channel is lock, it returns BCCH channel number, location number, MNO code and cell ID. It returns UNLOCKED if no channel lock.

		+BCCH: UNLOCKED OK or ERROR	
Test	AT+GTBCCH=?	+BCCH: <mode list>,<bcch1>,…<bcchn> OK or +BCCH: <mode list>,LOCKED OK or ERROR	It returns mode list and the 7 BCCH channels number with strongest signal if unlocked. It returns mode list and "LOCKED" if locked.

Parameter instruction:

<Parameter>	Description
<mode>	0: unlock 1: It locks the corresponding BCCH cell channel if <bcch> is NULL. It locks the desired BCCH channel as <bcch> set. The set <bcch> will be saved in module and keep the lock after powering on. 2: same as 1. (compatible in the previous version) 32: list BA-list. Note: AT+GTSET="BCCHSAVE",1 (default is 0) must be set. It must use AT+GTBCCH=2,XX to lock channel for power out save. If BCCH is not available or with weak signal, network will be disconnected or cannot register network after power on.
<bcch>	Channel number
<num>	Return BCCH numbers of BA list. No more than 32.

Example:

AT+GTBCCH=?

+BCCH: (0,1,2),115,113,111,123

OK

AT+GTBCCH=1

+BCCH: LOCK SUCCESS

OK

AT+GTBCCH?

+BCCH: 115,MCC:460,MNC:01,LAC:2540,CELL ID:79BB

OK

AT+GTBCCH=?

+BCCH: (0,1,2),LOCKED

OK

AT+GTBCCH=0

+BCCH: UNLOCK SUCCESS

OK

AT+GTBCCH=2,111

+BCCH: LOCK SUCCESS

OK

AT+GTBCCH?

+GTBCCH: 111,MCC:460,MNC:01,LAC:2540,CELL ID:79BA

OK

AT+GTBCCH=32

+BCCH: 88,68,70,50,52,80,596

+BA(32):13,28,31,46,50,52,56,58,64,68,70,72,76,80,82,84,512,516,536,540,542,544,588,590,592,594,596,605,43,48,54,57

8.2 +GTBAND

Lock GSM Channel

Note: If BCCH channel is locked, other channel will not be able to lock.

Command	Syntax	Response/Action	Remarks
Set	AT+GTBAND=<band>	+BAND: LOCK SUCCESS	Lock specific channel.

		OK or ERROR	
Read	AT+GTBAND?	+BAND: <band> OK or ERROR	Query locked channel.
Test	AT+GTBAND=?	+BAND: <band list> OK or ERROR	Return band list.

Parameter instruction

<Parameter>	Description
<band>	0: auto-select channel 1: lock GSM900MHZ 2: lock DCS1800MHZ

Example:

AT+GTBAND=1

+BAND:LOCK SUCCESS

OK

AT+GTBAND?

+BAND:1

OK

AT+GTBAND=?

+BAND:(0-2),0:auto,1:gsm900,2:dcs1800

OK

8.3 +GTOPT

Lock network operator. Need to reboot module.

Command	Syntax	Response/Action	Remarks
Set	AT+GTOPT=<opt>	+NET STATE: <state> OK or ERROR	Lock specific operator.
Read	AT+GTOPT?	+OPT: <opt> OK or ERROR	Query locked operator.
Test	AT+GTOPT=?	+OPT: <opt list> OK or ERROR	Return to operator list.

Parameter instruction:

<Parameter>	Description
<opt>	0: automatic 1: CMMC 2: Unicom
<state>	Network register situation: 0: Unregistered. ME doesn't select network to register yet. 1: Registered. Register to the local network. 2: Unregistered. ME is selecting network to register. 3: Register denial. 4: Register unknown error. 5: Registered. Register to roaming network.

Example:

AT+GTOPT=1

+ NET STATE: 1

OK

AT+GTOPT?

+OPT: 1

OK

Reboot Module

AT+CREG?

+CREG: 0,0

OK

AT+GTOPT?

+GTOPT: 1

OK

AT+GTOPT=?

+OPT:(0-2),0:AUTO,1:China Mobile,2:China Unicom

OK

8.4 +GTCALIST

Read signal carrier list.

Command	Syntax	Response/Action	Remarks
Read	AT+GTCALIST	+CALIST: <ca0>…<can> OK or ERROR	Read signal carrier list.

Example:

AT+GTCALIST

+CALIST: 98,111

OK

9 AT Command Instruction of LBS

The functions below are only supported by V0B.09.20 (G600), V0C.00.11 (G610-Q50) and V0C.05.11 (G610-A50) or above.

9.1 +GTGIS, Search GIS Information in GPRS Network.

This command will send a query for GIS information, receive the response and report the GIS information to user.

Note:

- G600 cannot support this AT command when voice call established.
- This AT command didn't support in MUX mode.
- It recommended that we should better activate PDP (AT+MIPCALL=1,"xxx") in firstly.

Command	Syntax	Response/Action
Set	+GTGIS=<Type>[,Language>[,<Option>]]	OK +GTGIS: <GIS Information> or: +GTGIS: <ERROR Information> or: ERROR: <err>
Test	+GTGIS=?	+GTGIS: (list of supported <Type>s), (list of supported <Language>s), (list of supported <Option>s)

The following table shows the +GTGIS parameters.

<Parameter>	Description
Type	1 –Normal mode: use GSM Cell Information for GIS query 2 –Normal mode: use Option for GIS query(Option format 1) 3 - Normal mode: use Option for GIS query(Option format 2) 11 –Supper mode: use GSM Cell Information for GIS query 12 –Supper mode: use Option for GIS query(Option format 1) 13 - Supper mode: use Option for GIS query(Option format 2)
Language	1-English, default value is 1 2-Chinese

Option	A String for describing both of latitude and longitude. It supports 2 formats now. For example: latitude 22.5385, longitude 113.9379 should be described : In Option format 1 as:"22.5385,113.9379"; In Option format 2 as:"2232.3143,N,11356.2741,E"
GIS Information	A Simple string says the GIS Information. For example: "latitude":22.5384,"longitude":113.9383,"country":"China","country_code":"CN","region":"Guangdong Province","city":"Shenzhen","street":"Shennan Road","street_number":"No.1"
ERROR Information	A Simple string says the ERROR occur during GIS query For example: SERVER ERROR NETWORK ERROR PDP TIMEOUT ……

9.2 +GTSET, Super Mode Configuration

This AT command will set the destination server/port for GTGIS super mode.

With different destination server/port, the super mode of GTGIS command will return the result in different format.

Command	Syntax	Response/Action
Set	+GTSET=<future>,<value>	OK or: ERROR

The following table shows the +GTSET parameters related GTGIS super mode.

<Parameter>	Description
<future>	"GISSUPERPORT": Set the GIS destination port for super mode.
<value>	1000-30000 The default value is 5555.

	Before you set this parameter, please refer to GHT and make sure the port is already supported. GHT will support more and more super server port in future.
<future>	"GISSUPERSERVER": Set the GIS destination Server for super mode.
<value>	Hostname. The string length should less than 63 bytes. Default set to"szgps.xicp.net". Before you set this parameter, please refer to GHT and make sure Host is available.

9.3 Query Command without Longitude & Latitude Data

This command supposed to use in the scene where GPS module is unavailable. It gets longitude & latitude data and GIS information via base station. The command and parameter are shown as below:

Command and parameter:

AT+GTGIS=1,1 //Return English longitude & latitude data and rough GIS address

AT+GTGIS=1,2 //Return Chinese longitude & latitude data and rough GIS address

AT+GTSET="GISSUPERPORT",5100 //Set strengthen mode

AT+GTGIS=11,1 // Return English longitude & latitude data and accurate GIS address

AT+GTGIS=11,2 // Return Chinese longitude & latitude data and accurate GIS address

Command & parameter example:

Terminal sends AT command:

AT+GTGIS=1,1

Server returns:

OK

+GTGIS: "latitude":22.53788,"longitude":113.940271,"country":"China","country_code":"CN","region":"Guangdong","city":"Shenzhen","street":"Shennan Ave","street_number":"No. 1 "

Terminal sends AT command:

AT+GTSET="GISSUPERPORT",5100

Server returns:

OK

Terminal sends AT command:

AT+GTGIS=11,1

Server returns:

OK

+GTGIS: 22.537880,113.940269,

Guangdong Province; Shenzhen; Nanshan District; Keyuan Nan Ave /South High-tech Seven Road (Cross) WestNorth 120meters; Shenzhen Virtual University Park EastSouth 50 meters; Shenzhen High-tech Industrial Zone (R3-B) WestNorth 40 meters;

600

9.4 Query Command with Longitude & Latitude Data

This command supposed to use in the scene where GPS module is available. It gets longitude & latitude data and GIS information via GPS module. The command and parameter are shown as below:

Command and parameter:

AT+GTGIS=2,2,"longitude 1, latitude 1" // Return Chinese GIS address

AT+GTGIS=3,2,"longitude 2, latitude 2" // Return Chinese GIS address

AT+GTSET="GISSUPERPORT",5100 // Set strengthen mode

AT+GTGIS=12,2,"longitude 1, latitude 1" // Return Chinese GIS address

AT+GTGIS=13,2,"longitude 2, latitude 2" // Return Chinese GIS address

Command & parameter example:

Terminal sends AT command:

AT+GTGIS=2,2,"22.538571,113.937901"

Server returns:

OK

+GTGIS: "latitude":22.538571,"longitude":113.937901,"country":" China "","country_code":"CN","region":" Guangdong "","city":" Shenzhen "","street":" Shennan Ave "","street_number":" No. 1"

Terminal sends AT command:

AT+GTGIS=3, 2,"2232.3143,N,11356.2741,E"

Server returns:

OK

+GTGIS: "latitude":22.5385,"longitude":113.9379,"country":" China "","country_code":"CN","region":" Guangdong "","city":" Shenzhen "","street":" Shennan Ave "","street_number":" No. 1"

Terminal sends AT command:

AT+GTSET="GISSUPERPORT",5100

Server returns:

OK

Terminal sends AT command:

AT+GTGIS=12,2, "22.534534,113.935417"

Server returns:

OK

+GTGIS: Guangdong Provice; Shenzhen; Nanshan District; Baishi Ave/ South High-tech One Road (Cross) WestSouth 170meters; Arts & Design College EastNorth 290 meters; Zhengyuan One-station Car Service WestSouth 110 meters;

Terminal sends AT command:

AT+GTGIS=13,2,"2232.07204,N,11356.12502,E"

Server returns:

OK

+GTGIS: Guangdong Provice; Shenzhen; Nanshan District; Baishi Ave/ South High-tech One Road (Cross) WestSouth 170meters; Arts & Design College EastNorth 290 meters; Zhengyuan One-station Car Service WestSouth 110 meters;

9.5 Procedure of LBS Functions

AT+CSQ

+CSQ: 27,99

OK

AT+CPIN?

+CPIN: READY

OK

AT+CGREG?

+CGREG: 001,001

OK

AT+MIPCALL=1,"CMNET" //PPP dial, set wireless APN

OK

+MIPCALL: 10.206.243.14

AT+MIPCALL? //Check received local IP address

+MIPCALL: 1,10.206.243.14

OK

//The operation above is checking the condition of current network and module. Activate PDP manually and connect to GPRS network.

//General mode of LBS. Query GIS information by base station in English.

AT+GTGIS=1

OK

+GTGIS: "latitude":22.538571,"longitude":113.937901,"country":"China","country_code":"CN","region":"Guangdong","city":"Shenzhen","street":"Shennan Ave","street_number":"No.1"

// General mode of LBS. Query GIS information by base station in Chinese.

AT+GTGIS=1,2

OK

+GTGIS: "latitude":22.538571,"longitude":113.937901,"country":"中国","country_code":"CN","region":"广东省","city":"深圳市","street":"深南大道","street_number":"1 号"

// General mode of LBS. Query GIS information by GPS coordinate in Chinese.

AT+GTGIS=2,2,"22.538571,113.937901"

OK

+GTGIS: "latitude":22.538571,"longitude":113.937901,"country":"中国","country_code":"CN","region":"广东省","city":"深圳市","street":"深南大道","street_number":"1 号"

// General mode of LBS. Query GIS information by GPS coordinate in Chinese. – Pay attention to the

different format with example above.

AT+GTGIS=3, 2,"2232.3143,N,11356.2741,E"

OK

+GTGIS: "latitude":22.5385,"longitude":113.9379,"country":"中国","country_code":"CN","region":"广东省","city":"深圳市","street":"深南大道","street_number":"1 号

10 CODE Conversion

The functions below are only supported by V0B.09.20 (G600), V0C.00.11 (G610-Q50), V0C.05.11 (G610-A50) and above.

10.1 Command of +GTCODE for Code Conversion

GB2312 and UCS2 can be converted to each other by this AT command.

Command	Syntax	Response/Action
Set	+GTCODE=<Type>,<String>	+GTCODE: <Length> <Result> OK or: ERROR: <err>
Test	+GTCODE=?	+GTCODE: (1,2),(text) OK

Parameter instruction of +GTCODE:

<Parameter>	Description
Type	1: GB2312 converts to UCS2. The conversion result can be sent via SMS in textual. 2: UCS2 converts to GB2312.
String	Character string for conversion. Note: If Type=1, string cannot contain quotation mark and is no more than 140 bytes. If Type=2, string is no more than 280 bytes.
Length	String length after conversion.
Result	String of conversion result.

Example:

AT+GTCODE=1,"Fibocom"

+GTCODE: 20

004600690062006F0063006F006D

OK

AT+GTCODE=2,
"00570065002000610072006500200067006C006100640020007900 6F00750020006300610 06E002000750
07300650020006F00750072002000630 06F006D00700061006E00790027007300200070007200 6F0064007
5006300740073002E"

+GTCODE: 47

We are glad you can use our company's products.

OK

10.2 Send Chinese SMS in Textual

UCS2 string converted by the command above can be sent in textual by SMS. Therefore, it can send Chinese SMS in textual.

Pay attention to the following steps for Chinese SMS sending in textual.

AT+CMGF=1 ---- set as textual

AT+CSCS="UCS2" ---- set as UCS2

AT+CSMP=17,167,0,8 ---- set SMS code as 8

AT+CSCA="xxxxxx" ---- set correct SMS station (usually unnecessary)

It can send Chinese SMS after setting as above.

Example:

GB2312 converts to UCS2:

AT+GTCODE=1,"深圳广和通"

+GTCODE: 20

6DF157335E7F548C901A

OK

Send SMS with conversion result:

AT+CMGS="13812345678"

>6DF157335E7F548C901A<Ctrl-Z>

+CMGS: 145

OK

11 Related AT Commands & Instruction of GPS functions

The functions below are only supported by V0B.10.20 (G600), V0C.01.11 (G610-Q50), V0C.11.13 (G610-A50) and above.

11.1 +GTGPSPOWER, GPS Power Management

It is used to set working mode of GPS module. There are four modes are supported by GPS module: power-on, power-off, sleep and wake-up.

Command	Syntax	Response/Action	Remarks
Set	+GTGPSPOWER=<mode>	OK Or ERROR	It is used to set working mode of GPS module.
Read	+ GTGPSPOWER?	+ GTGPSPOWER: <mode>,<antena_state> OK	Read GPS working mode and condition of GPS antenna.
Test	+ GTGPSPOWER =?	+ GTGPSPOWER: <0,1,2,3> OK	Return the range of GPS mode.

The following table shows the + GTGPSPOWER parameters.

<Parameter>	Description
<mode >	Working mode of GPS module: 0: power-off 1: power-on 2: sleep 3: wake-up
< antena_state >	Condition of GPS antenna: 0: without GPS antenna 1: with GPS antenna

Example:

AT+GTGPSPOWER=0

OK

AT+GTGPSPOWER=1

OK

AT+GTGPSPOWER=4

ERROR

AT+ GTGPSPOWER?

+ GTGPSPOWER：1,1 // First number indicates GPS working mode while the second indicates GPS antenna condition.

OK

AT+ GTGPSPOWER =?

+ GTGPSPOWER：(0,1,2,3)

OK

11.2 +GTGPS, Output GPS Data via Series

GPS must be in power-on or wake-up mode to use this command, otherwise, it returns ERROR.

Command	Syntax	Response/Action	Remarks
Set	+GTGPS=<interval>,<type>	OK or: ERROR:	Set interval period and data type of output.
Read	+ GTGPS?	+ GTGPS: <intervl>,<type> OK	Read interval period and data type of GPS output.
Test	+ GTGPS =?	+ GTGPS: (0-60),(0-15)	Test the setting format and range of this command.

The following table shows the + GTGPS parameters.

<Parameter>	Description
< intervl >	GPS output interval period: User query GPS data type and return data only once. Interval period: 1-60. Output GPS data every time at interval.
< type >	Output data type: (marked based on bit and randomly composed) 0: stop data output 1: output GPGGA data 2: output GPGSA data 4: output GPGSV data 8: output GPRMC data

Example:

AT+GTGPSPOWER=1

OK

AT+GTGPS = 0 ,0 // no data output

OK

AT+GTGPS = 0 ,15 // output all types of data only once (15=1+2+4+8).

$GPGGA,091520.000,2229.8692,N,11354.7062,E,1,08,1.5,37.3,M,-2.6,M,,0000*7E

$GPGSA,A,3,19,03,23,06,13,16,11,24,,,,,2.3,1.5,1.8*31

$GPGSV,3,1,12,19,79,208,20,03,65,025,26,23,53,235,41,06,50,035,18*7F

$GPGSV,3,2,12,13,45,291,30,16,35,036,19,11,21,186,31,24,04,186,28*74

$GPGSV,3,3,12,31,13,122,17,32,02,193,25,30,18,059,,07,13,319,*7A

$GPRMC,091520.000,A,2229.8692,N,11354.7062,E,0.49,243.21,080611,,,A*6B

OK

AT+GTGPS = 1 ,15 // output all types of data every one second (15=1+2+4+8).

OK

$GPGGA,091617.000,2229.8687,N,11354.7071,E,1,08,1.5,35.2,M,-2.6,M,,0000*7C

$GPGSA,A,3,19,03,23,06,13,16,11,24,,,,,2.4,1.5,1.8*36

$GPGSV,3,1,12,19,81,211,18,03,63,025,25,23,52,233,43,06,48,035,19*73

$GPGSV,3,2,12,13,45,291,30,16,35,036,19,11,21,186,31,24,04,186,28*74

$GPGSV,3,3,12,20,01,214,18,31,12,123,13,32,01,192,24,30,17,060,*7B

$GPRMC,091617.000,A,2229.8687,N,11354.7071,E,0.00,206.17,080611,,,A*63

$GPGGA,091618.000,2229.8687,N,11354.7071,E,1,08,1.5,35.2,M,-2.6,M,,0000*73

$GPGSA,A,3,19,03,23,06,13,16,11,24,,,,,2.4,1.5,1.8*36

$GPGSV,3,1,12,19,81,211,24,03,63,025,26,23,52,233,43,06,48,035,19*7F

$GPGSV,3,2,12,13,45,291,30,16,35,036,19,11,21,186,31,24,04,186,28*74

$GPGSV,3,3,12,20,01,214,20,31,12,123,14,32,01,192,24,30,17,060,*77

$GPRMC,091618.000,A,2229.8687,N,11354.7071,E,0.00,254.15,080611,,,A*69

....

.....

....

AT+GTGPS = 2 ,3 // output GPGGA, GPGSA data (3=1+2) every two seconds.

OK

$GPGGA,091617.000,2229.8687,N,11354.7071,E,1,08,1.5,35.2,M,-2.6,M,,0000*7C

$GPGSA,A,3,19,03,23,06,13,16,11,24,,,,,2.4,1.5,1.8*36

$GPGGA,091619.000,2229.8687,N,11354.7071,E,1,08,1.5,35.2,M,-2.6,M,,0000*73

$GPGSA,A,3,19,03,23,06,13,16,11,24,,,,,2.4,1.5,1.8*36

…

….

AT+GTGPS =3 ,8 //output GPRMC data every three seconds.

OK

$GPRMC,091708.000,A,2229.8697,N,11354.7071,E,0.00,4.62,080611,,,A*6F

$GPRMC,091711.000,A,2229.8697,N,11354.7071,E,0.00,341.36,080611,,,A*6D

$GPRMC,091714.000,A,2229.8697,N,11354.7071,E,0.00,359.59,080611,,,A*65

…..

AT+GTGPS?

+GTGPS:3,8

AT+ GTGPS =?

+ GTGPS：（0-60）,(0-15)

OK

12 Other Functions

12.1 Jamming Feature

AT+MJDC command is used to turn on or off jamming detection function. It will send the unsolicited result code +MJDC to DTE and telling jamming detection condition if the function is on.

Command	Syntax	Response/Action	Remarks
Set	+MJDC=<mjdc_mode >	OK or: ERROR:	Turn on or off jamming detection function
Read	+ MJDC?	+MJDC: <mjdc_mode>,[jamming_detection] OK	Read the current value and condition of jamming detection.
Test	+ MJDC=?	+MJDC:(range<mjdc_mode>) OK	Test the setting format and range of this command.
Unsolicited Report		+MJDC:<jamming_detection>	Indicate the received condition.

The following table shows the + MJDC parameters.

<Parameter>	Description
<mjdc_mode>	0: jamming detection off (default) 1: jamming detection on
<jamming_detection>	0: no jamming signal 1: with jamming signal

Example:

AT+MJDC = 1 // turn on Jamming detection

OK

+MJDC: 1 // Module turns on jamming detection and reports with unsolicited result code +MJDC:0 if jamming signal is detected.

// Module turns on jamming detection and reports this if jamming signal is gone.

12.2 Recording

12.2.1 +AUDCD

Recording control

Command	Syntax	Response/Action	Remarks
Set	AT+AUDCD=<mode>	OK or: ERROR +ASTOP:Format <dsp_format>, Time <mm>: <ss>,Frame <frames>,Len : <buf_len>	mode=0 stop recording mode=1 begin to record mode=2 stop playing record mode=3 begin to play record
Test	AT+AUDCD =?	+AUDCD: (list of supported <mode>s),(list of supported < requested dump >s) OK	Return supported parameter (0-3)

Parameter instruction

<Parameter>	Description
<mode>	mode=0 stop recording mode=1 begin to record mode=2 stop playing record mode=3 begin to play record
+ASTOP:Format <dsp_format>, Time <mm>: <ss>,Frame <frames>,Len : <buf_len>	It is displayed when stop recording or AT+AUDCD=0 is sent to stop recording. dsp_format: compress format of record 0: fr 1:amr mm:ss : recording time, e.g. 02:20 means 2 minutes and 20 seconds. frames : frame number of record, a frame for every 20 ms buf_len: Total size (bytes) of record.

Example:

AT+AUDCD=?

+AUDCD: (0-3)

OK

AT+AUDCD=1

OK

AT+AUDCD=0

+ASTOP:Format 1,Time 00:26,Frame 1326,Len 17244

OK

AT+AUDCD=3

OK

AT+AUDCD=2

OK

12.2.2 +AUDPM

Recording parameter setting:

Command	Syntax	Response/Action	Remarks
Set	AT+AUDPM= <bitrate>,<dsp_format>	OK or: ERROR	No data and turn off module after returning OK.
Test	AT+AUDPM=?	OK	Just return OK.

Parameter instruction:

<Parameter>	Description
<bitrate>	This parameter is valid when dsp_format=0, which means record in AMR format. 0~7 indicates seven different dsp sampling rate: 0 - AMR 4.75 - Encodes at 4.75kbit/s 1 - AMR 5.15 - Encodes at 5.15kbit/s 2 - AMR 5.9 - Encodes at 5.9kbit/s 3 - AMR 6.7 - Encodes at 6.7kbit/s 4 - AMR 7.4 - Encodes at 7.4kbit/s 5 - AMR 7.95 - Encodes at 7.95kbit/s 6 - AMR 10.2 - Encodes at 10.2kbit/s 7 - AMR 12.2 - Encodes at 12.2kbit/s
Dsp_format	Dsp sampling compressed format 0 fr

	1 amr

Example:

AT+AUDPM=0,1

OK

12.2.3 +AUDRL

Read recording information

Command	Syntax	Response/Action	Remarks
Set	AT+AUDRL=<index>	+ASTOP:Format <dsp_format>, Time <mm>: <ss>,Frame <frames>,Len : <buf_len> OK	Return the parameter of record file corresponding to the index
Test	AT+AUDRL=?	+AUDRL:(0) OK	Return OK directly

Parameter instruction:

<Parameter>	Description
<*index*>	Index of record file. It supports only one presently so it is fixed as 0.
+AUDRL:Format <dsp_format>, Time <mm>: <ss>,Frame <frames>,Len : <buf_len>	It is displayed when stop recording or AT+AUDCD=0 is sent to stop recording. dsp_format: compress format of record 0: fr 1:amr mm:ss : recording time, e.g. 02:20 means 2 minutes and 20 seconds. frames : frame number of record, a frame for every 20 ms buf_len: Total size (bytes) of record.

Example:

AT+AUDRL=0

+AUDRL:Type 2,Time 00:01,Frame 74,Len 968

OK

AT+AUDRL=?

+AUDRL(0)

OK

12.2.4 +AUDRD

Read recording data:

Command	Syntax	Response/Action	Remarks
Set	AT+AUDRD=<index>,<offset>,<read_len>	OK \r\n+AUDRD :<return data length>\r\n <record data> OK	Return recording data
Test	AT+AUDRD=?	OK	Parameter range

<Parameter>	Description
<*index*> <offset> <read_len>	Index of record file. It supports only one presently so it is fixed as 0. Read offset value of record in buffer. This value cannot exceed the valid range of buffer. Read data length (range from 1 to 1024). It is decided by the length of valid data.
\r\n+AUDRD :<return data length>\r\n <record data>	return data length: data length returned from ME Record data: the record data displayed in HEX

Example:

AT+AUDRD=0,100,200

+AUDRD: 200

393788209AE483B09D96042B0071E637D6BBCB6FFBAC1404153CFAC18B87C64CB8E891CE04708B77B61A
FCF4821883D03004DC8137B1771FBBAC036BC84204941E76B334AB52EACFA0ED24043781EBF36BE680D6
6458A62604338BB0B57B632633071980F8043300FE33563A9404824CA8EA0433EA37E84B354D45D83704
AE04341E3C893BA8D1860ABE15AC04143C876378A78ADEC0524F6404A10033351BF730BC2E9C0646043
33C11D817904B35C00C8BEE04A1671033A404E223AD931EB6043351650588265B

OK

AT+AUDRD=?
+AUDRD: (0),(0-99999),(1-1024)

OK

12.2.5 Brief Instruction of Recording

1. When module is on standby, it can begin or stop the recording of current input channel by AT commands.
2. When module is in phone state, it can begin or stop the recording of calling by AT commands.
3. There are 100 Kb space for current record data which is saved in RAM. If the sampling rate is 4.75kbit/s, it can save about record data with 160 seconds.
4. Record data can be read by AT commands. User can save the record in the space that he chooses.
5. It will clear and reset the data space in buffer every time when begin to record. So will the data.
6. It will stop recording and prompt notice when RAM is not enough for data saving. Application then read the data and send command to restart recording (old record data will be cleared).
7. Record data is saved as streaming form and saved as AMR file after being read by AT commands.
8. It supports AMR format with 16bit.

12.3 Reset SIM Card by AT Commands

In following cases, SIM card can be reset by AT commands and work after registering to network again.

1. The physical link between module and SIM card is alright, but they cannot communicate with each other because of vibrancy or other reasons.
2. SIM card inserted after module power on.

Command	Syntax	Response/Action	Remarks
Set	AT+GTSIMRST	OK	It returns OK only if the address book of SIM card is ok.